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Two Sections—Section One

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Railway Age

WITH WHICH IS INCORPORATED THE RAILWAY REVIEW

FIRST HALF OF 1927—No. 28

NEW YORK—MAY 28, 1927—CHICAGO

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Volume 82

Number 26

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ODDS AND ENDS OF RAILROADING

NEWS OF THE WEEK

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Railway Age

Vol. 82, No. 26

May 28, 1927

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Reducing Operating Expenses

WITH the income and the outgo of the railroads so largely controlled by external influences, the problem of reducing the operating expenses and increasing the net income, thus strengthening the financial position and credit of the railroads, is no mean task. President R. B. White, of the Central Railroad of New Jersey, commented at the May meeting of the New York Railroad Club on the great value of the car retarder in hump yard operation, as a factor in reducing operating expenses. He emphasized the savings in man-power, in loss and damage to freight, in damage to equipment and in personal injuries, and commented on the value of the car retarder in speeding up the movement of traffic and increasing the yard capacity with reduced forces. The statement was made during the course of the meeting that car retarders are now being used in seven yards and are being installed in four additional ones. Apparently, also, the retarder may be used successfully in comparatively small yards, as evidenced by the results at the Hartford, Conn., yard of the New Haven. Seldom has a subject at a railroad club meeting been received with so great interest, and this applies as well to a similar program in April before the Central Railway Club.

Passenger Service, Accomplishment and Acknowledgment

NEWs of further improvements in passenger service comes almost daily. Two roads announce important reductions in schedules; another refurbishes its locomotives, using brighter colors; another adds equipment of radically improved design; new limited trains are scheduled where slower local trains were heretofore the only service available. Rumors of further improvements are frequently heard and, unlike most rumors, they are generally true and as frequently understate the actual developments as exaggerate them. None of this means, of course, that the railroads are attracting back the short-haul local passenger in any numbers. Rather it indicates that, having lost the bulk of such traffic, they are making a bid for a business which, while not new to them, was heretofore a much smaller proportion of the total. That they are going out after this business with determination and intelligence there can be no gainsaying. And they are backing up their selling efforts with actual performance which frequently excels the promise of their advertising. The opinion of a competent, disinterested observer is always of value. An appreciation of modern passenger train service as exemplified by the Twentieth Century Limited, written by Christopher Morley, appeared not long ago in the *Saturday Review of Literature*. The *New York Central Lines Magazine*, with pardonable pride, reprints it in its current issue.

Railroad men who have in recent years so greatly improved their service to the public deserve tributes of this kind, and, we believe, they would receive more of them if all passengers were as articulate as Mr. Morley.

Diesel Locomotives Tested

NINETEEN Diesel electric locomotives are now in service or on order in this country, as shown in a committee report recently presented at the International Railway Fuel Association convention in Chicago, being solely of the electric transmission type and used in switching service. Some of these locomotives, varying in weight from 60 to 145 tons and developing 300 to 750 hp. respectively, have been in service since the latter part of 1925 and test data have therefore been obtained under almost every kind of operating condition encountered in switching service. The following interesting comparisons are made in the report between a 100-ton, 600-hp., Diesel electric and a steam switching locomotive of about the same rated capacity, working 371 hours in one month: Fuel consumption of the Diesel-electric, 12.9 per cent of that of the steam locomotive; wages, the same; enginehouse expense, 61 per cent less, lubrication, 24 per cent more; other supplies, 50 per cent less. In another case, involving the use of locomotives on a single eight-hour shift each day, the average cost of Diesel electric operation per month was only two-thirds that of steam although much greater savings would obviously have been possible if the demands of the service had called for two or more shifts. The general adaptability of the new type of switching power to service on sharp curves and heavy grades such as are found on industrial tracks seems to be well established.

Draft Gears and Cars

IN discussions of draft gears, so much attention has been centered on the characteristics of the gears as devices quite complete in themselves that attention has been, in a measure, distracted from the real purpose of the draft gear as a part of the car. Without draft gears, it will readily be admitted that both cars and lading would suffer constant damage and the useful life of the cars would be extremely short. From this, then, it may be inferred that the measure of effectiveness of draft gears is the relative freedom of the cars equipped with them from damage to themselves and to their lading. This can probably be most effectively measured by the relative life of the cars between rebuilding periods and the relative amount expended in maintenance during the life of the car. The draft gear has been aptly described as a form of car insurance. In the absence of any real information as to the life history of the gears and cars in service, however, few railroads are in a position to

appraise intelligently the kind of protection they are buying in relation to the premium they are paying on the policy. It is to be feared that laboratory investigations alone will always fall far short of furnishing the real facts as to this life history.

More Clarity in Reclaim Rules

THE proper assessment of per diem reclaim and detention charges for switching movements is a complicated business at best. For this reason, it is highly important that local per diem and reclaim associations at various terminals couch their rules in as simple language as possible. Too often in the past, such rules have been drafted in a manner that is very reminiscent of a lawyer's brief and where this has been the case, the results have been disastrous. Constant bickerings and misunderstandings have arisen and these are expensive at best, even when they are eventually adjusted amicably. There should be no similarity between the language of such rules and legal phraseology. The purpose of the rules is to clarify the situation, not to befog it. The rules should be in plain English, railroad English, avoiding all legal circumlocutions. If this is done, much misunderstanding and costly squabbles will thereafter be avoided.

Less Equipment—More Service

NO facts regarding the improvements in the plants of the railways being continuously made by the investment of new capital to effect increases in the efficiency of operation are more significant than those regarding the numbers of freight cars and locomotives being installed and retired. On January 1, 1922, the railways had 2,283,908 freight cars and 64,742 locomotives on their lines. They are now handling a much larger freight business than then—in fact the largest freight business for this time of year in history—and yet on April 15, 1927, they had on their lines only 2,280,803 freight cars and only 61,769 locomotives. The number of freight cars was almost the same as five years ago, while the number of locomotives was almost 3,000 less. The explanation of their ability to handle the present traffic, and at the same time maintain substantial surpluses of cars and locomotives, is to be largely found in the increases that have occurred in the average capacity of freight cars and the average tractive power of locomotives. The average freight car had, five years ago, a capacity of 39½ tons, while now it has a capacity of 45.3 tons. The average locomotive had, five years ago, a tractive power of 36,935 pounds and now has a tractive power of 41,951. In consequence, while there has been no increase in the number of freight cars and a substantial decline in the number of locomotives, the total amount of freight car capacity and locomotive power available are larger than ever before. In addition, improvements that have been made in tracks, terminals, signals and so on and in the methods used in operating all the physical facilities, have resulted in cars and locomotives being moved more miles per day than ever before. The increases in the average capacity of power of freight cars and locomotives have been accomplished by retiring old and installing new equipment. The new equipment has cost much more than that which it has replaced, but the expenditure of capital for it and other improved facilities has made it possible to render a greatly increased service and render it better while reducing the cost of furnishing each unit of transportation service.

Maintenance of Train Control Turbo-Generators

THE advent of automatic train control has fixed the permissible voltage or speed variation of the headlight turbo-generator sets within quite definite limits. Too high a voltage will burn out lamps and too low a voltage may cause train control failure. Some concern has been felt about a possible train control failure resulting from low voltage caused by low steam pressure. This situation need cause no alarm about a failure on the road, because 28 volts is sufficient for any type of train control. With the headlight set in normal condition, a reduction of steam pressure would cause the train to stall long before it caused the generator voltage to drop to 28. Steam pressure for testing train control apparatus in the enginehouse is of more importance. It is desirable from a point of fuel economy to bring the locomotive in under as little steam as is practicable. It is also desirable to have 32 volts available at the generator terminals for testing the train control equipment when the locomotive is brought in. For this purpose, either a reasonably high steam pressure is needed or the turbo-generator set must be in first-class condition. Perhaps a compromise between the two is the proper solution of the problem. It is possible to have a headlight set in such condition that it will develop 32 volts with the train control load and without the headlight load on 60 pounds of steam. This means that the bearing and brush friction must be very small, that all parts run true and, most important of all, that the steam nozzle is in proper alignment with the turbine wheel. If the steam jet strikes the blades of the turbine off-center it will cause a steam eddy which will render it impossible to develop 32 volts at the generator with low steam pressure. Thirty-two volts on 60 pounds of steam may be impossible for every day operation, but it remains with each road using turbo-generators for train control operation to determine what degree of excellence is practicable in maintaining them.

Accounting Revision Again Delayed

ON May 7, as was duly reported at the time, the Interstate Commerce Commission announced that it had decided to postpone the effective date of its depreciation order of November 2, 1926. The reasons for the postponement have already been discussed in these columns. These were the difficulty of accomplishing the preliminary work incidental to the order in the time available before its effective date and the desire to permit time for consideration of a petition asking for rehearing and reconsideration of certain aspects of the order. A by no means unimportant feature of the situation is an interesting parallel with what has been done with the proposed revision of the accounting classifications. Inasmuch as the accounting for depreciation must perforce be covered in the accounting classifications, it apparently follows that postponement of decision with reference to depreciation also results in a further postponement of the classifications. The Interstate Commerce Commission has been for several years trying in one way or another to revise its accounting classifications. While considerable progress has been made, particularly in the past year, much still remains to be done. The chief complication of the situation, either with reference to depreciation accounting or the classifications generally, seems to be a difficulty of determining exactly what it is desired to accomplish, a factor particularly magnified in the case of the classifications by a seeming lack of desire on the part of those involved to come out

in the open and discuss what they have in mind. It was first intimated that the purpose of the revision of the classifications would be to recognize the new responsibilities given the commission in the Transportation Act, with particular reference to approval of security issues, rate making and economy and efficiency of operation. Later, the purpose seemed to be to revise the classifications in the light of experience had with them since they were last revised in 1914. Now that the situation is again further complicated by the complexities of the depreciation order, perhaps by the time the railroad world actually does get some new accounting classifications some new basis of action will have been discovered beyond those already mentioned.

Railroads and the Stock Market

EXAMPLES multiply of the high favor with which investors regard the stocks of railroad companies. A recurrent feature of the stock market during the past three or four years has been its willingness from time to time to boost the prices of the stocks of railroads rumored to be involved in merger plans. Considering this fact it might have been expected that after the adverse decision with respect to Mr. Loree's proposed new Southwestern System there would be at least a slight decline, especially in those stocks particularly affected from the merger point of view. However, this did not take place and the decision seems to have been accepted with hardly a ripple. There are now three or four recent cases in which adverse decisions have been received by the stock market either with only a temporary reaction or none. The other cases include the Supreme court's decision in the Los Angeles & Salt Lake valuation case, the Interstate Commerce Commission's announcement of its depreciation order and its decision in the St. Louis & O'Fallon case. That the railroad shares have continued so popular may indicate that the market is more influenced by the abundance of capital seeking investment than by developments calculated to affect future earnings per share.

The Capacity of a Single Track

THE track capacity of many single-track lines has been greatly increased by the use of automatic block signals. Among other advantages contributing to this result is the elimination of train stops for orders, the form "19" order being substituted for the form "31." The next step is to eliminate train orders entirely and direct train movements by signal indication. The Missouri Pacific has been demonstrating the practicability of such a system for over two years on a 50-mile single-track sub-division between Osawatomie, Kan., and Leeds, Mo. On this installation the principal passing tracks are lap sidings with the switches operated by interlocking plants, traffic direction locking being used between towers. The Central of Georgia has recently completed a 25-mile installation of signals on single track in which train movements are directed by signal indication, in which only a few of the switches are remotely controlled and power operated. The interlocking is confined to desk lever machines at two points, and traffic direction locking is provided automatically by the unique circuits used. The New York Central is also completing an installation on 40 miles of single track from Berwick, Ohio, to Stanley, on which trains will be directed by signal indication, the switches being power operated and remotely controlled. These three installa-

tions differ considerably, but they all permit a change in the meeting point of trains at any time up to the arrival of either train at the meeting point. If one train fails to make the running time which the dispatcher expected, the other train can be advanced one or more sidings. Under the train order system such a change can not be made unless operators are located at each of these sidings. Furthermore, unless automatic signals are provided, "31" orders requiring train stops are commonly considered necessary and with such an arrangement a "meet" can not ordinarily be changed in time to take advantage of the delay, even if the dispatcher receives information regarding the delay promptly. The increased flexibility of train operation permitted by the direction of train movements by signal indication and the power operation of remote switches place entirely new values on the track capacity of busy single-track lines that deserve the thorough investigation of those roads now considering additional facilities.

Railway Service Continues Despite Flood

THE flood which is now approaching New Orleans is the most destructive ever experienced in the Mississippi Valley. The area that has been flooded and that which will be flooded will reach staggering proportions. The railways have suffered heavy damage on both sides of the river, and much track has been under water, some of it for weeks, and service has been interrupted in many places. In spite of their troubles the railways affected, however, may well be proud of their achievements during the disaster, for not only have they been prime movers in the work of transporting and caring for refugees, but, except for an occasional interruption of a day or so, they have kept their main lines open and have operated trains on such lines on schedules close to normal.

To anyone who has visited the flooded area, it would seem impossible to run trains at all, yet, despite almost insurmountable obstacles, the trains have run, the principal through freight and passenger routes have been kept open and a "business as usual" spirit has animated officers and employees. Their haggard faces testify to sleepless nights, but the bulletin boards at the important stations show most of the trains marked up on time, with the freight trains keeping step with the superb performance. Too much cannot be said in praise of the sheer grit and ingenuity of the entire railway personnel in the flood districts which have made such a result possible.

Through service east of the river has never been seriously interfered with, although, for a few days, it was necessary to operate through water south of Cairo, on the main Chicago-New Orleans line of the Illinois Central. The greatest interruption to service on the east side has been in western Mississippi, but the main line of the Illinois Central was not affected, and service between Memphis, Tenn., and Vicksburg, Miss., has been maintained by detouring through Jackson, Miss. West of the river, Memphis-St. Louis service was interfered with for a short time, as was the service from Memphis to Little Rock and points south and west, but these interruptions were temporary and were soon remedied. As the flood moved down into southern Arkansas and Louisiana, it covered many miles of Missouri-Pacific tracks, although a glance at the map will indicate that this road, by reason of its network of alternate routes in this territory, was admirably equipped to meet an emergency of this sort by detours. This was done and is

being done. As the flood moved southward, it has severed the main lines of the Texas & Pacific, the Missouri Pacific and Gulf Coast Lines into New Orleans, but these are the only important through lines not now in actual operation and these railroads were not caught unawares, for they had made arrangements to detour their trains via the Southern Pacific and the through routes are still being kept open.

The performance of the railways during the flood has been remarkable and proves again that, given half a chance, the roads can meet any emergency and at the same time render invaluable public service.

Three Kinds of Ton-Miles

ONE of the familiar bits of humor of an earlier era was the assertion that there were three kinds of falsehoods; lies, damn lies and statistics. In other words, there was a certain intimation, usually offered in jest, that if one wanted to lend a false impression it could be done by judicious selection of the figures or if it were desired to conceal the truth it could be done by presenting so many figures that the facts were hidden in a maze of statistical data. This jest as applied with reference to railroad statistics has now largely passed out of the picture if for no other reason than that the statistics of the industry have become better standardized and understood than formerly.

However, while railway statistics may no longer be suitable for the purpose of concealing the facts, they still contain traps for the unwary who may succeed in finding supposed truths in the statistical data that, in fact, are not truths at all.

One of the complications, for example, is the definition of such a simple term as ton-miles. In an earlier day, ton-miles were merely defined as the product of the tonnage multiplied by the distance the tonnage was hauled. Today this definition still applies except that now there are three kinds of ton-miles;—revenue, net and gross. The revenue ton-mile is self-explanatory. The net ton-miles include both revenue and non-revenue ton-miles. In other words, they include the total lading in the cars, or the actual traffic handled by the railroad whether commercially or in connection with its own activities of operation and maintenance. The gross ton-miles include the net ton-miles and also the weight of the cars multiplied by the distance hauled.

The unit of gross ton-miles was known on only a few roads prior to federal control. It is the unit chiefly used by the transportation officer who is responsible for getting the traffic over the road as economically as possible. The unit is too new to have permitted full use of it. It is the basis, however, of checking train-loading when applied in the units of gross tons per train and of combined train-loading and train-speed when applied in the unit of gross ton-miles per train-hour. It is used in checking fuel consumption in the unit pounds of coal per thousand gross ton-miles. Some roads use it also to check costs in the unit cost per thousand gross ton-miles, different roads including different selections of cost items for this purpose. There is, however, one difficulty with respect to gross ton-miles and that is that there are too many of them. Thus, in 1926 as compared with 1920, there was an increase of 8 per cent in revenue ton-miles, an increase of 9 per cent in net ton-miles, but an increase of no less than 20 per cent in gross ton-miles. Whereas in 1920 net ton-miles constituted 49 per cent of the gross ton-miles, meaning that the weights of the lading and of the cars in trains (including, of course, the weight of the empty cars) were about the same, in 1926 the ratio

had been reduced to 44½ per cent. Those who use railway statistics are, of course, familiar with the various reasons for the relatively greater increase in gross ton-miles than in net ton-miles. Among them is the relatively great increase in empty car mileage, a factor recently discussed at length in these columns. A second reason is the increase in average car capacity and weight which has occurred within recent years, and a third, the lighter average loads per car resulting from the greater proportion of high-grade freight. It would appear that these represent a certain burden resulting from the improved car supply and more expeditious service that the railroads are now giving the public. They represent, nevertheless, factors that the analyst must keep in mind as he uses the unit derived from the basic gross ton-miles data, or indeed, railway statistics generally. To operating men the problem is one of analyzing the several factors in their true relationships and of taking such reasonable steps as conditions permit to keep gross ton-miles at a minimum.

On the whole, the problem seems rather similar to that involved in train-loading. Some years ago the tendency was rather too strongly in the direction of heavy train loading at the expense of other factors. More recently, there has been a greater recognition of the desirability of greater speeds, and of more ton-mile output per train-hour. The solution of the problem of securing the most economical relationship of train-load and train-speed came about when there was adequate appreciation of all the factors involved. It may appear that one of the next steps in the direction of the further economies of operation towards which the railroad industry is continually striving will be adequate appreciation of the desirability of securing a more satisfactory relationship between gross and net ton-miles.

Commission Misrepresents the Railways' Attitude

THE majority opinion of the Interstate Commerce Commission in the O'Fallon valuation case is so replete with fallacious and unfair reasoning that a large volume could be devoted to answering it. One of the most extraordinary features of it is the use made of the prolonged failure of the railways to complain loudly about the way the commission has regulated them, and appeal from it to the courts, as evidence that the carriers have accepted the commission's peculiar views on railway economics.

"In 1920, after the return to private control," the majority opinion says, "we authorized general increases in rates based upon an aggregate value figure which was less than the aggregate recorded investment for road and equipment and working capital which the carriers wished us to use as a basis. They did not then ask us for a 'value' based on the current price level, and accepted without complaint the increases authorized. In 1922 we required a general reduction in rates, using as the basis an aggregate value similar to that used in 1920. This reduction was not contested by the carriers. In 1926 we denied a general increase in rates proposed by the carriers in the western district, and in that proceeding the carriers, while arguing that the current price level warranted a far higher 'value,' asked only that their aggregate recorded investment in road and equipment and working capital be used as a basis. * * * It appears, therefore, that since the price revolution brought about by the world war, the railroads have not had nor have they sought returns based upon 'values' swollen in har-

mony with the rise in general price levels. * * * They have realized that to do so would be to risk conflict with inexorable economic conditions."

These statements show clearly that the carriers have complained too little about the kind of regulation they have received since 1920, and that they incur the danger, if they even briefly sleep upon their rights in dealing with the commission, of having it set up the claim that they have conceded its fairness and superior economic wisdom. The commission could not have given the carriers a broader hint to fight it openly in every case in the future in which they believe it has shown lack of wisdom, of fairness and of regard for law.

Valuations for "Fair Return"

The record shows that during the last six years the commission, measured even by the standard of principles it has deliberately adopted and announced it should be guided by, has given the railways plenty to complain about. Although, in its decision in the rate case in 1920, it announced a tentative valuation of \$18,900,000,000 as of December 1, 1919, the net operating income earned by the railways in 1921 was sufficient to yield a return of 5¾ per cent on a valuation of less than \$10,500,000,000. In spite of this the commission in 1922 made general reductions of rates. The commission's statement that "this reduction was not contested by the carriers" is so ambiguous and misleading as to amount to a complete misrepresentation. The carriers did contest before the commission in 1921 a proposed reduction of rates on grain and grain products, which the commission, nevertheless, ordered to be made. The carriers then, on January 1, 1922, put into effect a general reduction of 10 per cent on all farm products in the hope that the commission would reduce the reductions on grain and grain products to this basis. But the commission did not do so. Subsequently, the carriers opposed a general reduction of 10 per cent on all other freight, which the commission nevertheless made. There is any truth at all in the commission's statement only because the carriers did not appeal from its orders to the courts. The result was that in 1922 they earned a net operating income equivalent to a return of 5¾ per cent on a valuation of only about \$13,250,000,000. An increase in the investment in the properties of about \$4,000,000,000 has occurred since 1920, but in the last six years, during which on the commission's own basis, the average valuation has exceeded \$20,000,000,000, the average annual net operating income of the carriers has been equivalent to a return of 5¾ per cent on the total valuation, averaging only about \$16,500,000,000.

When the commission used to urge Congress to authorize it to make a valuation this was done upon the ground that valuation was needed to enable it to determine what would be a fair return for the railways to earn. It knew then, and it knows now, that under all the decisions of the courts a lawful valuation would give effective weight to present-day costs. It declines now, however, to give them such weight on the ground that the return produced would be larger than necessary, and Commissioner Eastman says: "The place to make allowance for the depreciation in the value of the dollar, if it can be shown that justice requires an allowance, is clearly in the rate of return rather than the rate base." But not only has the commission for six years failed and refused to make any allowance in the rate of return for the depreciation in the value of the dollar, but it has also failed and refused, regardless of the depreciation in the value of the dollar, even to let the carriers earn what it has held would be a fair return on a valuation made on its own basis. It has, not, therefore, given the railways any encouragement to rely upon it to let them earn a fair

rate of return, whether measured by its own or by any other standard of valuation.

The majority report dilates at great length upon the deplorable and "ludicrous" results that would be produced by an attempt to change the valuation in accordance with fluctuations in costs. It says: "If it is permitted to fluctuate with each change in the general price level, and if rates must be adjusted accordingly, there can be no promise of a stable return to investors. But if current cost of reproduction is to be used as the basic measure, wide and frequent fluctuations both up and down are inevitable." As in many other parts of its opinion, the majority here exemplifies its skill in knocking out a straw man. Nobody wants a rate base that will constantly fluctuate. The ground for the contention that present-day costs should be recognized is that present-day costs apparently have been stabilized on a much higher level than pre-war costs, and, if this is so, then a valuation that recognized present costs would be just as stable as one based on the costs that the commission accepts.

Furthermore, the commission's regulation of rates in the past has not indicated any interest, much less zeal, in the cause of stabilizing returns to investors. In 1915, under rates fixed by the commission, the net operating income of the carriers was \$1,058,500,000; in 1917, \$950,557,000; in 1921 only \$601,000,000, or more than 40 per cent less than in 1916; and in 1922, still only \$760,000,000, or 30 per cent less than in 1916. Between 1921 and 1926 the net operating income earned doubled. The commission expresses fear that speculators would make a lot of money out of railway securities if its so-called "rate base" were moved up and down in accordance with changes in railway costs of construction. But these speculators actually have made barrels of money as a result of the 40 per cent decline in net, and the subsequent great increase in it, that have occurred within the last ten years without any change in the "rate base" because of increased costs. Fluctuations in the prices of railway securities are due to changes in the net return earned, regardless of what may be the cause of these changes. The commission has had an opportunity for 20 years to try to so regulate rates as to stabilize net returns, but apparently never discovered the desirability of doing so until it found it could be used as an argument against a lawful valuation.

Commission, Not Conditions, "Inexorable"

The majority report says that the carriers have heretofore accepted the commission's findings regarding rates and valuation because "they have realized that to do so would be to risk conflict with inexorable economic conditions." That this is not true is demonstrated by the records of hearings before the commission. It was reserved for the radical majority of the commission to discover these "inexorable conditions," as is shown by the fact that railway managers opposed most of the reductions of rates made in 1922 and tried to get advances in the West in 1926. Not "inexorable economic conditions," but an inexorable commission, a majority of whose members have been dominated by radicalism or fear of the radical politicians, it is that the railways have been confronted with. They have not heretofore realized this. They have had enough confidence in the commission's fairness and regard for law to believe that sooner or later it would make a lawful valuation and let them earn a fair return on it. They know now, as a result of the decision in the O'Fallon case, that the commission has no intention of doing this, and probably never has had. It is not to be assumed, therefore, that they will in the future acquiesce so readily in its policy as to give it opportunity to say again that they have accepted its unfairness as fair and have bowed to its economic omniscience.

B. & M. Solving Unusual Terminal Problem at Boston

Extensive improvements and long delayed unification of freight facilities will mean much to both shippers and the railroad

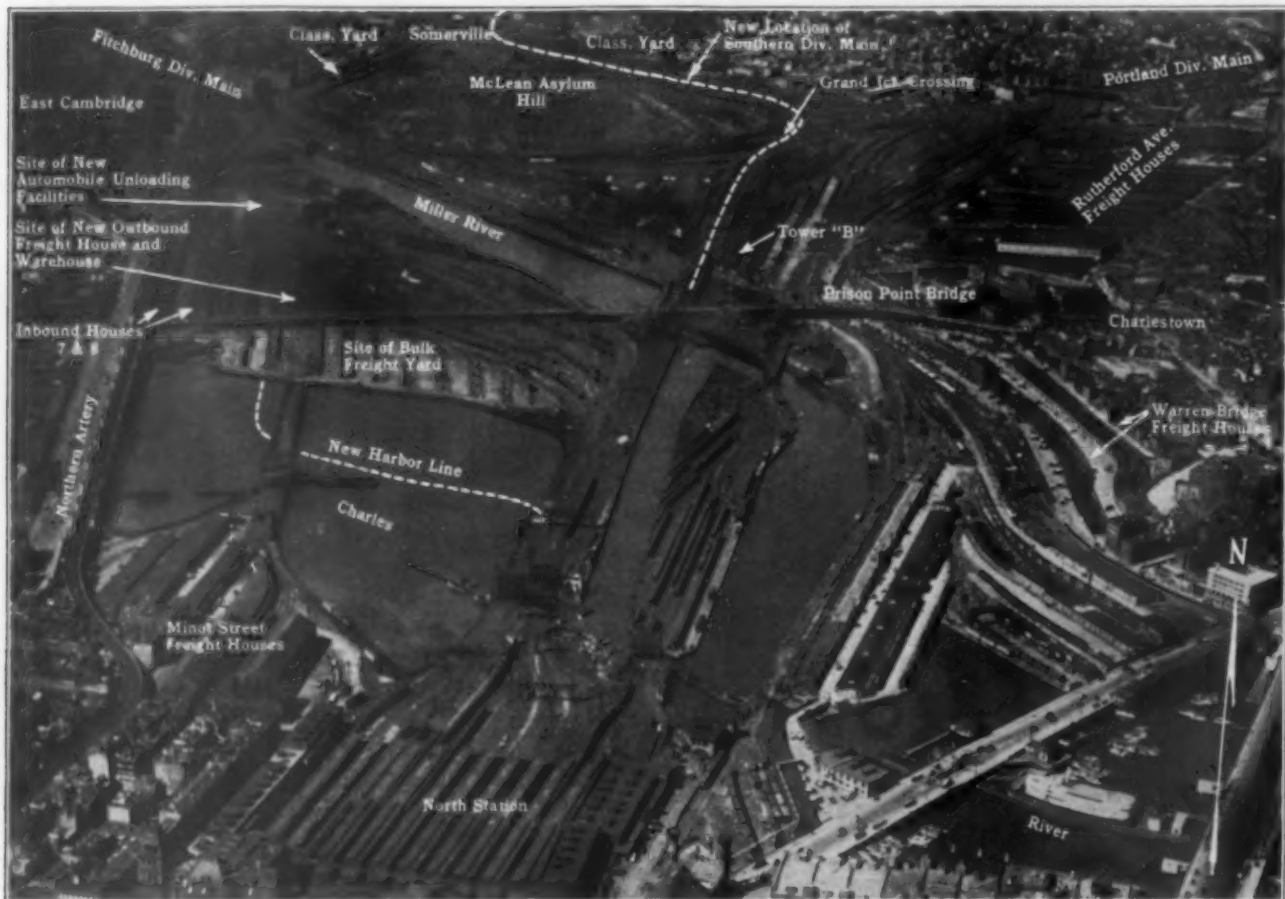
AFTER many years of study and planning, the Boston & Maine is now engaged in a \$5,000,000 project to unify its freight terminals at Boston and thereby simplify an unusually burdensome operating problem. For years this road has labored under a situation at Boston almost unique in railroading. While one road, it has until now, of necessity, operated over and served the public through the separate track and freight facilities of its four principal constituent roads, crowded into an irregular and congested area of land and water, and has been forced to meet present-day transportation conditions of motor and rail co-ordination, with facilities which were originally laid out with the primary purpose of providing rail-water connections.

In remedying this situation the Boston & Maine entered upon a comprehensive program, in connection with which it expended about \$2,000,000 in 1926, is spending in the neighborhood of \$3,000,000 more this year, and plans to spend further sums in 1928 to rearrange, improve and modernize its freight terminal facilities at Boston. The unified and modernized terminal is expected

to be in service this fall. The two primary objects of this extensive project are: first, to improve and expedite freight service, enabling the Boston & Maine to better serve the public and the industries of New England, and to recover traffic which has been lost to the motor truck and other competitive agencies, and, second, to enable large operating economies to be effected through the co-ordination of yards, freight houses and other facilities, which in turn will materially reduce switching and the necessary handling of freight.

Constituent Roads Built to Themselves

As previously stated, the present facilities of the Boston & Maine for serving Boston are the non-coordinated facilities of the four principal roads which were joined to make up the present railroad. These were the Boston & Lowell, originally chartered in 1830 as a 26-mile line between Boston and Lowell, Mass.; the Andover & Wilmington, chartered in 1833 as a 7-mile branch of the Boston & Lowell, but later extended into New Hampshire and Maine and called the Boston & Maine, and



Looking Over the Boston & Maine's Congested Terminal Area at Boston

still later extended direct into Boston on its own line from Wilmington, giving up the use of the Boston & Lowell tracks; the Eastern railroad, incorporated in 1836 and opened from East Boston to Salem, Mass., and later extended direct into Boston and eastward to Portland, Me.; and the Fitchburg railroad, incorporated in 1842, extending between Boston and Fitchburg, Mass., and later to the Hudson river. These roads, all of which entered Boston from the north in one general section, grew and developed along the lines most favorable to themselves, particularly in the vicinity of Boston where competition was most severe, until one by one they were absorbed by the Boston & Maine to form a single system, and to become three of its five main divisions, the Portland, the Fitchburg-Berkshire and the Southern divisions.

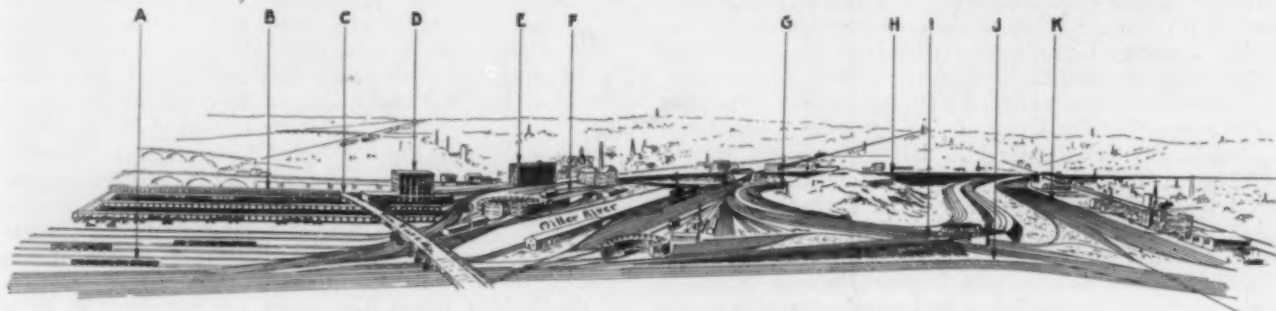
Consolidation of these roads in name, however, was effected much more readily and easily than consolidation in fact. This was true particularly around Boston where in developing passenger and freight yards, stations and other facilities along the north water front of Boston and in East Cambridge, East Somerville and Charlestown, the greater portion of which was completely under water in 1818, each road had built for itself without any relation to the others. Thus the present North station in Boston, into which all of these roads have operated for 25 years as the Boston & Maine, and the yards and freight facilities lying just across the Charles river, were built to a large extent on made ground and in such a manner as to create congested facilities. While the terminal occupied a total of 470 acres, exclusive of its dock property, 65 acres were actually supported on piling and bridges until the recent improvements. This situation has necessitated expensive and difficult maintenance of tracks and structures in this territory, but the greatest problem encountered has been the economical and expeditious operation of the terminal under the un-coordinated condition of the freight facilities. For the most part, this latter problem has been due to the difficulty of

countered by the Boston & Maine at Boston, it should not be forgotten that until the present improvements were well under way, both shipper and consignee on the Boston & Maine shared in the adverse results brought about by these conditions, more particularly through the retarded handling of freight through the yards and freight houses, and of considerable importance, the necessity of delivering and collecting less than carload freight



Constructing the Relocated Main Line of the Southern Division at the Crossing of the Grand Junction Railroad

shipments at a number of different points. The seriousness of this latter consideration is better appreciated when it is realized that under the old condition truckmen in some instances have had to go to four distinct freight-house districts, Minot street (Boston), East Cambridge, and Warren bridge and Rutherford avenue in Charlestown, in order to deliver a single load of l.c.l. freight, with a separate door for each destination. This situation made it necessary in some instances for a teamster to



Panoramic Sketch of the Modernized Freight Terminal to Serve Boston

- (A) Bulk delivery yard for the Southern and Fitchburg divisions, and, ultimately, also for the Portland division.
- (B) New outbound steel freight house and covered platforms in East Cambridge. Present freight houses No. 7 and 8, in which inbound business will be concentrated, lie just beyond the new outbound facilities.
- (C) Junction of Northern Artery, Prison Point bridge and proposed Lcop highway.
- (D) New reinforced concrete outbound storage warehouse.
- (E) New general office building which was completed during the summer of 1926.

- (F) New automobile unloading facilities.
- (G) McLean Asylum hill partially cut away to provide filling material and space for the new classification tracks.
- (H) Inbound hump classification yard in Somerville which is being enlarged.
- (I) New passenger main line of the Southern division.
- (J) Portland division passenger main line.
- (K) Enlarged outbound hump classification yard for all divisions in East Somerville.

interchanging freight from one division to another through existing track arrangements; the lack of co-ordination between the inbound and outbound freight house facilities of the three divisions, which has necessitated extensive transfer movements continually within the terminal; and the difficulty of clearing through the terminal for the movement of the 365 passenger trains which the Boston & Maine operates daily into and out of North station.

While these have been the outstanding difficulties en-

make as many as 14 stops in distributing a single load of freight.

Present Work Is the Result of Long Study

That these conditions could not exist indefinitely, with high operating costs and inconvenience to the industries of Boston, has long been recognized by Boston & Maine officers, who, though handicapped by the lack of funds, have been working on plans for the solution of the problems for at least 10 years. The final plans decided upon

were adopted after a lengthy survey and study of the Boston & Maine's operating and traffic problems and, in fact, of the transportation needs of New England and Boston as they exist and as they will probably exist in the future. In this study the Boston & Maine secured the services, as terminal experts, of George Hannauer, then vice-president of the Indiana Harbor Belt railroad and now president of the Boston & Maine, and John F. Stevens, builder of the Panama canal and pathfinder of the Great Northern, who, together with the engineering and operating officers of the Boston & Maine and their organizations, are responsible for the final plans and their many details.

Broadly speaking, the plans for the work now under way take into consideration the necessity for co-ordinated



The Six-Story Shippers' Warehouse Under Construction

terminal facilities and the importance under modern conditions of a close relation between rail terminals and motor trucking highways, supplanting the at-one-time controlling importance of close water-rail connections. To this end, the plans for the terminal itself will simplify operation within the terminal and bring into closer and more efficient relation freight houses, delivery tracks, trucking driveways and points of interchange between the road's several divisions, with all such changes and additions to existing facilities as will be necessary.

Specifically, these plans call for the relocation and consolidation of l.c.l. freight facilities, which include a large outbound freight house and warehouse with ample auxiliary platforms, already constructed; the alteration and, in part, consolidation of the present bulk yard facilities of each division, with the addition of adequate concrete and paved driveways; the construction of modern automobile unloading facilities; the alteration and enlargement of present inbound and outbound yards, with car-retarder-equipped gravity classification; the relocation of the Southern division passenger main lines for a distance of about 7,500 ft. to preclude the operation of passenger trains through the freight terminal; and the elimination, through filling, of about 28 acres of piling and trestle work. The total cost of this work is expected to approach \$5,000,000, of which amount about \$3,500,000 will have been expended on the work already finished or to be completed by the middle of this year.

L. C. L. Facilities Being

Concentrated in East Cambridge

While all of this work is more or less interlocked in

the general unification plan of the Boston & Maine's facilities at Boston, it is quite apparent that the larger part of the project and, in fact, the larger part of the anticipated economies to be effected by it, is centered around the relocation and concentration of the l.c.l. facilities of the various divisions, which, until now, have been widely scattered. This concentration of facilities is being effected in East Cambridge, just across the Charles river from the North station, a location selected after considerable study, because of its close proximity to the Northern Artery and the proposed Loop highway, with direct access to the business and industrial districts of Boston. For a similar reason, the main bulk delivery yards of the various divisions will be concentrated in this same district, although it is understood that auxiliary bulk delivery yards in units of moderate size will be located at such points as will be attractive to the shippers and receivers of freight in various localities.

In the plan for the new facilities in East Cambridge, inbound l.c.l. freight will be handled in the present freight houses Nos. 7 and 8 at East Cambridge, which have been used exclusively by the Southern division, and outbound l.c.l. freight will be concentrated with the new freight facilities just east of houses Nos. 7 and 8. These latter facilities consist of a new brick and steel freight house, a reinforced concrete storage warehouse, two long covered transfer platforms, and a track layout of 12 tracks lying adjacent to and extending the full length of the buildings and platforms.

New Freight House and Storage Warehouse

The new outbound freight house and warehouse, which is located just east of the Northern Artery and extends under the Prison Point bridge, is 640 ft. long by 50 ft. wide and is divided into three sections, a two-story unit about 360 ft. long, a one-story unit about 80 ft. long, and a 200-ft. concrete unit, 100 ft. of which is one story high and 100 ft. six stories high. The first two sections of this building, which form the freight house proper, are steel frame structures with tar and gravel covered timber roofs and with brick end walls and intermediate fire walls. Both floors of these units are of wood on wooden floor beams and girders, the first or trucking floor consisting of 1-in. finished maple on 2-in. unfinished planking. Both sides of the two-story section of the building consist entirely of steel sash and freight doors, the sash being placed above a row of continuous sliding steel doors which extend the full length of the building on the track side, and above a row of rolling steel doors, separated only by columns, along the entire length of the building on the trucking side. In the one-story section of the freight house, the doors are surmounted by a single row of continuous sash, this being sufficient to provide daylight within the building when the doors are closed. Integral with the building along each side is a continuous plank-deck trucking platform, protected over its full length by a canopy. The second floor of the building, the interior of which will be finished throughout, is to be used as a freight office and for the storage of records.

The warehouse unit of the new facilities, which is about 200 ft. long by 50 ft. wide, lies directly in line with and is a part of the new freight house. This unit is a reinforced concrete structure of two sections, a six-story section at the north end, 100 ft. long, and a one-story section of the same length at the south end, the floor of this latter unit being integral with and forming an extension of the freight house floor. Thus, in reality, the new outbound freight house has a trucking floor about 640 ft. by 50 ft. with an area of about 32,000 sq. ft., both sides of which are provided with continuous plat-

forms and protecting canopies. The five stories above the trucking floor of the six-story section of the warehouse are to be used exclusively by local l.c.l. shippers, this arrangement making it possible for such shippers to carry a stock of their merchandise, whether originating in Boston or received in car-load lots, directly at the shipping point, from which it can be sent out in l.c.l. shipments with minimum delay.

In all, this warehouse provides about 25,375 sq. ft. of storage space, all of which is adequately daylighted through the large areas of steel sash provided on all four sides of the building. While it is expected that this area will be adequate to meet the present demand for such a facility, it is interesting to note that the 100-ft. one-story section of the warehouse has been so constructed as to make it possible to increase its height to six stories without altering its foundation, or interfering with the operation of the freight house when such enlargement is deemed necessary.

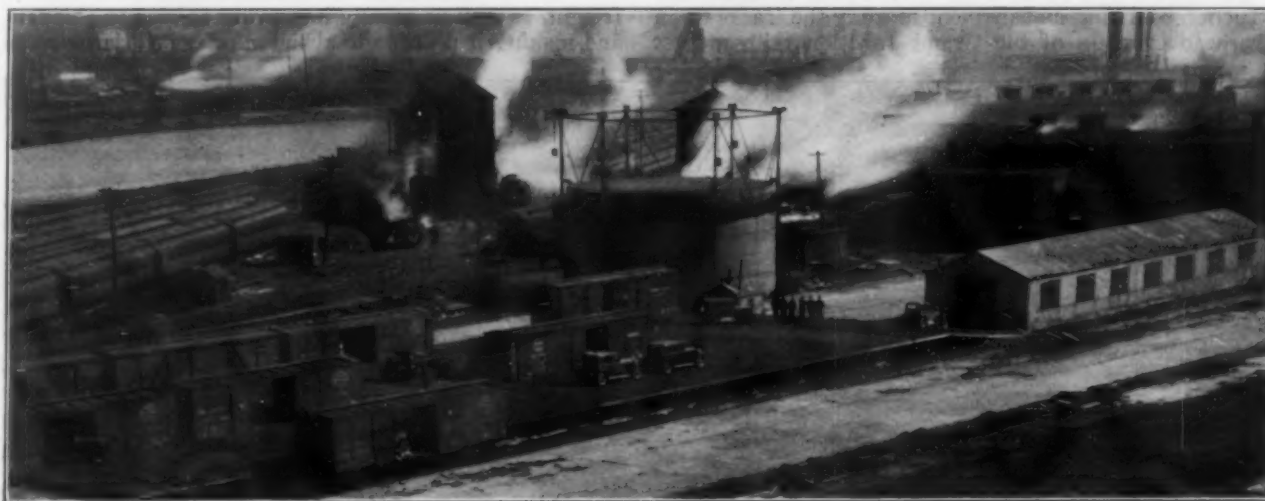
Adequate Tracks, Platforms and Driveways are Provided

The track layout in connection with the new outbound freight house and warehouse consists of 12 stub tracks. These tracks, which are on the east side of the buildings, are arranged in two groups of six tracks each, these units being separated by a 700-ft. transfer platform 30 ft. wide, and served by an additional platform of about the same size along the east side of the outermost track. This latter platform, trucking access to which is afforded over a wide driveway along its entire length, is in direct

Cambridge, immediately, and to bring over the Portland l.c.l. business late in 1927 or as soon as auxiliary changes within the terminal, necessary to this change, will make it possible. When complete consolidation of the now widely separated outbound l.c.l. facilities of the various divisions is effected, marked advantages will accrue to both shippers and the railroad. To the shipper, these "single-dump" facilities will mean the expediting of some shipments as much as 24 hours, and will result in large convenience and saving to industries and truckmen through their ease of access and through the new arrangement whereby one stop to deliver an outbound load will replace the 1 to 14 stops that have been necessary formerly. From the standpoint of the railroad the new facilities will bring about a reduction of about 20 per cent in all switching at the terminal with prompter delivery and forwarding of shipments, which in itself will result in an estimated saving of approximately \$240,000 a year.

New Bulk Delivery Yard and Automobile Unloading Facilities

Other work of large importance under way within the East Cambridge area of the Boston & Maine's terminal at Boston includes the rearrangement and enlargement of the present bulk freight delivery yard just east of the new l.c.l. facilities, and the construction of modern automobile unloading facilities about 800 ft. north of the new l.c.l. terminal. The new bulk yard, which will be used by the Southern and Fitchburg divisions immediately upon completion, will also be used later by the Portland



The New Automobile Unloading Facilities and Garage Afford Every Convenience

contact with the intermediate platform and the freight house through a connecting platform at the south end of the house tracks. All of these platforms, which together have a floor area of about 32,000 sq. ft., are of frame construction and are covered by double-pitched sheds supported on two rows of columns.

While these are the principal outbound l.c.l. freight facilities nearing completion in East Cambridge, a new harbor line has been established along the north side of the Charles river, about 600 ft. south of the former line, and ultimate plans contemplate the filling in of this area, and the extension of all of the outbound facilities, including the freight house, platforms, tracks and driveways, to this new limit.

Under the present plan, it is proposed to consolidate the handling of all of the l.c.l. inbound and outbound freight of the Southern and Fitchburg divisions in East

division, a plan whereby these latter two divisions will have access to the East Cambridge facilities as well as to their present smaller yard unit, which will be maintained for the convenience of consignees of car-load shipments in other sections of the city. This new yard consists of 16 stub tracks, ranging from about 350 ft. to 700 ft. in length, these tracks being grouped into four units of three tracks each and two units of two tracks each. Between each of these units, pavements, about 40 ft. wide, will be provided, which will afford easy approach to and movement between the cars spotted for unloading.

The new automobile unloading facilities at East Cambridge, which, together with the enlargement work on the Hoosac tunnel recently completed, forms a part of the Boston & Maine's equipment for the handling of automobile shipments, are modern in every detail. These include two large frame platforms, 235 ft. long by 30 ft.

wide, connected at their south ends; an all-steel rail-side garage, 120 ft. long by 25 ft. wide, adjacent to the south ends of the platforms and on a level with them; air and water piped direct to the platforms; concrete pavements leading directly from the Northern Artery to the approach ramp of the platforms; and three unloading tracks with a total capacity of 34 cars. With these facilities both side and end-loading cars can be handled, space is provided for the fireproof storage of cars unloaded too late in the evening to be moved away the same day, and other minor, yet desirable, features necessary to the expeditious and convenient unloading of automobiles are provided.

Concentration of Freight Facilities

Necessitates Main Line Change

To avoid interference between the new freight facilities in East Cambridge and the heavy commutation and through passenger business, it was necessary to move the two main passenger tracks of the Southern division from their position where they bisected the East Cambridge freight terminal area to a new location where the passenger and freight traffic would be segregated as far as possible. This problem was solved by relocating these tracks some distance east of their old location, whereby minimum interference would be afforded to freight movements into and out of East Cambridge and to the some 365 passenger train movements daily into and out of the North station. This relocation of the Southern division main line, which begins in Somerville and swings to the east around McLean Asylum hill, as indicated in the aeroplane view of the terminal, necessitated the construction of a long embankment to carry the tracks to an overhead crossing of the Grand Junction railroad just

tion of a consolidated outbound gravity classification yard in East Somerville along the north and east sides of Asylum hill, between the tracks of the Southern and Portland divisions. Here, outbound trains for all three divisions will be made up, the cars being humped at the west end of the yard. While complete plans for this work are not yet available, it is understood that this new yard will have a capacity for 30 trains and approximately 1,200 cars, and will be fully equipped with a car retarder system. Another important piece of yard work contemplated at present is the enlarging of the existing yard along the north and west sides of Asylum hill to form a consolidated inbound classification yard for the various divisions. This yard, like the new outbound yard, will be fitted with a hump for gravity classification, and a complete car retarder installation for controlling the speed of cars being classified. These facilities will be located at the north end of the yard, just west of the similar facilities in the new outbound yard.

In addition to these improvements, many other changes are planned at various points throughout the terminal in order to improve switching conditions and to provide more direct connections and interchange between the several yard units. In all, these changes, including the relocation of the Southern division main line, will involve the construction of about 25½ miles of new tracks.

Annual Saving of \$500,000 Is Anticipated

When the entire project is completed at Boston in 1928, much of the Boston & Maine's terminal problem will be overcome, the new improvements enabling the more flexible and expeditious handling of all classes of freight, as well as greatly improving service to shippers, and making it possible to abandon or lease a large num-



Looking Over the Partially Completed Consolidated Outbound Freight House and Platforms

southeast of the Asylum hill. The crossing itself is effected by a two-span double-track bridge, one a through girder span and the other a through truss, which are supported by concrete abutments and a central reinforced concrete pier.

From this crossing the new Southern division main line approaches the North Station east of the Fitchburg division main line, which it joins at Tower "B," instead of coming in west of Miller river as has been the case for many years. The embankment for the new Southern division tracks was constructed from material taken from the Asylum hill, which is being still further cut away to secure filling material and to provide room for the extension and expansion of yards in this vicinity.

The largest yard work involved in connection with the Boston terminal improvements is the proposed construc-

tion of old facilities, inadequate or highly expensive to maintain. While the cost of these improvements will run into a large figure, it is conservatively estimated that resulting economies will make possible a saving in the neighborhood of \$500,000 annually.

Large and comprehensive as are the improvements already described, they are only a part of the major projects contemplated or being carried out by the Boston & Maine at Boston. Among the other improvements, two are the most outstanding: the intensive development of the area about and over the North Station, and the construction of a large perishable produce terminal in the Rutherford avenue freight-house district. The first of these projects, while not under way as yet, contemplates the erection of a 600-room hotel just west of the station, a large combined office and theater building just east of

the station, the reconstruction of the old Fitchburg station into an 1,800-car garage, the construction of a large sport auditorium and convention hall, seating from 18,000 to 20,000 persons, directly over the wide area of approach tracks to the North Station, and the rearrangement and widening of the principal thoroughfares around and approaching these new and improved facilities.

The new perishable produce terminal mentioned is already under construction. The principal facilities at the terminal will include a large fireproof structure for a display room and delivery shed, and two auction rooms, a modernized overflow delivery shed, a juice-grape house and bulk perishable delivery yards, and an effective arrangement of wide teaming thoroughfares, extending about the buildings and tracks and leading to the most direct routes to the business districts.

All of the engineering and construction work in connection with the improvements at Boston is being carried out under the general supervision of R. J. Hammond, assistant to the vice-president and general manager, and F. C. Shepherd, consulting engineer of the Boston & Maine. The main contract work, including some 300,000 cu. yd. of excavation, the laying of about 20,000 sq. yd. of pavement, and the construction of the freight house, warehouse, platforms and automobile-unloading facilities, is being handled by the Dwight P. Robinson Co., Inc., New York. All of the track work at Boston is being carried out by company forces.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended May 14 amounted to 1,029,126 cars, a decrease of only 622 cars as compared with the corresponding week of last year, in spite of the coal strike and the floods, and an increase of 43,247 cars as compared with 1925. Increases as compared with last year were reported from the Pocahontas, Southern and Northwestern districts but the other districts showed decreases. There were also decreases in the loading of coal, coke, forest products and merchandise, but other commodity classifications showed increases as compared with last year and all except forest products and ore showed increases as compared with 1925. Coal loading for the week amounted to 163,150 cars, as compared with

167,678 cars in the corresponding week of last year and 156,732 cars in 1925. Miscellaneous loading 394,794 cars, showed an increase of 8,216 cars as compared with the corresponding week of last year. The summary as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended Saturday, May 14, 1927

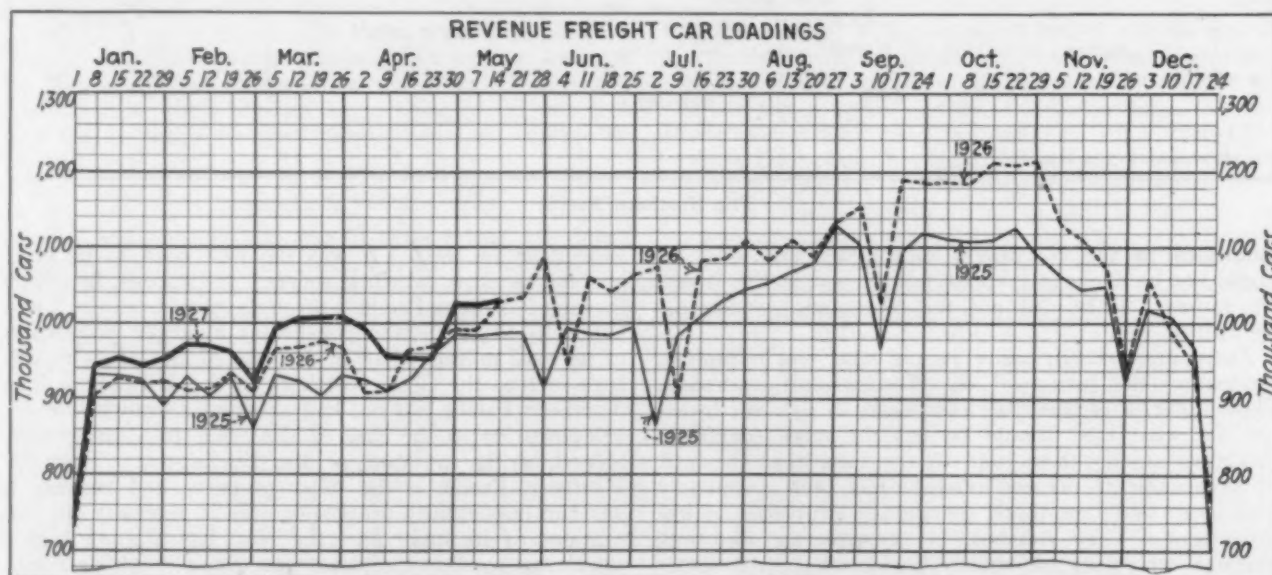
Districts	1927	1926	1925
Eastern	242,488	251,403	237,670
Allegheny	210,016	211,042	201,654
Pocahontas	63,000	56,390	49,894
Southern	153,404	148,547	141,089
Northwestern	155,690	153,001	154,186
Central Western	133,992	134,639	129,048
Southwestern	70,536	74,726	72,338
Total Western Districts	360,218	362,366	355,572
Total all roads	1,029,126	1,029,748	985,879
Commodities			
Grain and grain products	40,147	39,703	35,531
Live stock	29,161	26,464	26,419
Coal	163,150	167,678	156,732
Coke	10,897	11,797	9,676
Forest products	70,924	76,003	75,808
Ore	58,107	54,241	63,609
Mdse. l. c. l.	261,946	267,284	259,445
Miscellaneous	394,794	386,578	358,659
May 14	1,029,126	1,029,748	985,879
May 7	1,024,416	996,216	983,034
April 30	1,026,440	995,408	984,073
April 23	955,215	973,158	961,186
April 16	956,875	964,794	923,844
Cumulative total, 20 weeks	19,309,366	18,799,955	18,462,225

For the period ended May 8 the railroads had an average daily surplus of 245,113 freight cars, a decrease of 14,623 cars as compared with the preceding period. This included 82,395 coal cars and 121,270 box cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended May 14 totalled 62,050 cars, an increase over the previous week of 588 cars and a decrease from the same week last year of 1,352 cars owing to much lighter grain loading in the western division.

Commodities	Total for Canada			Cumulative totals to date	
	May 14 1927	May 7 1927	May 15 1926	1927	1926
Grain and grain products	7,664	7,751	11,177	150,394	130,147
Live stock	1,857	1,792	1,874	38,400	38,889
Coal	6,097	6,432	4,757	118,907	83,711
Coke	319	414	383	6,632	8,465
Lumber	4,212	3,858	3,665	63,519	63,867
Pulpwood	1,674	1,548	1,651	85,451	63,798
Pulp and paper	2,145	2,207	2,444	42,274	49,018
Other forest products	3,012	2,741	2,790	61,876	65,949
Ore	1,793	1,743	2,021	27,471	27,685
Merchandise, l. c. l.	17,894	17,472	17,184	316,275	295,822
Miscellaneous	15,383	15,704	15,456	238,356	228,409
Total cars loaded	62,050	61,662	63,402	1,149,555	1,055,760
Total cars received from connections	39,251	38,573	38,063	745,577	712,267



Northern Pacific Lacks Traffic

*Depression in territory and Panama Canal competition
added handicaps to inadequate rate structure—
Operating efficiency*

WHEN the announcements were made concerning the plans for the proposed merger of the Northern Pacific and Great Northern into a single northern railway system which would control also through entire stock ownership the Chicago, Burlington & Quincy and the Spokane, Portland & Seattle, several interesting arguments were given explaining the desirability of the merger. Among them two were of particular interest. One was the statement that 60 per cent of the stock of the two northern roads was held in common ownership. The other was the emphasis placed on the fact that the greater development of the Great Northern had been in the eastern section of the territory which the two northern carriers serve more or less in common, whereas in the case of the Northern Pacific the larger proportion of its mileage was in the western part.

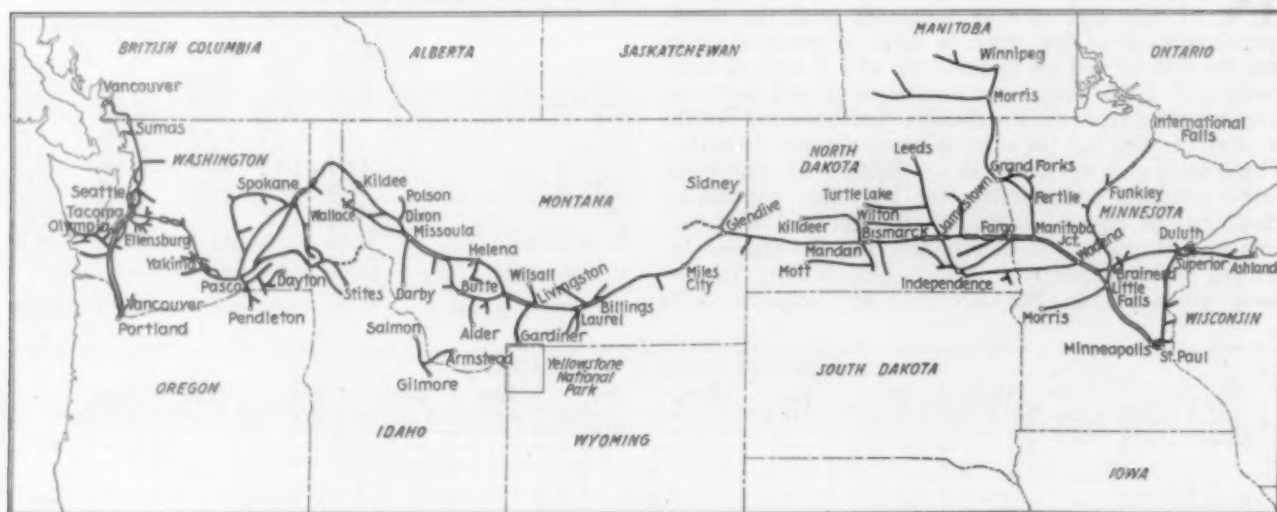
The interest that rests in the statement that 60 per cent of the stock of the two carriers is in common ownership, comes about because a large stockholder in each of the two roads is Arthur Curtiss James who recently attained front page notice in the newspapers because of having acquired a working control of the Western Pacific. It is to be presumed that Mr. James knows

grade Northwestern carriers, is practically assured of improvement in the price of these shares at some time in the future, although it may be indefinite as to how soon in the future this desirable outcome may take place.

Greater Development in Western Part of Territory

Analysis of the mileage by states will show that in the case of the great Northern, the mileage west of the Montana-North Dakota state line is only about 35 per cent, while in the case of its sister carrier, it is 60 per cent. This situation is of particular importance at this time because of the pending rate case in so-called Western trunk line territory. There is no telling at this time what the outcome of the hearings on this matter is to be, but it is evident that if there is to be any increase in rates in this district the Northern Pacific will not benefit therefrom as much as the Great Northern. Presumably neither would benefit as much as would the Burlington.

The Northern Pacific operates a total of 6,682 miles and its lines extend from Minneapolis and Duluth to Puget Sound following more or less generally the route over which Lewis and Clark proceeded in their famous



The Northern Pacific

conditions in the Northwest thoroughly and that he would not be likely to increase his interest in the Western railways if he did not feel optimistic concerning the future.

There are, indeed, many people who feel optimistic concerning the future of the Northwestern railroads. They admit, it is true, that conditions in the Northwest are not what they should be but the more optimistic observers among them hold to the view that the lack of prosperity at present existing has been adequately discounted and that there are already evidences of improvement. They contend, in consequence, that any investor who puts his money in shares of the better

expedition in 1803. It was the first road to be built into the territory which it serves. It happens, however, that the Northern Pacific's through route from the Twin Cities to Puget Sound constitutes a larger proportion of its total mileage than in the case of any of its neighbors such as the Great Northern or the Milwaukee. The Northern Pacific has not had as great a branch line development as in the case of the other two carriers or, indeed, as in the case of the Burlington. That the Northern Pacific is the older property and because it has had opportunity proportionately to intensify the operations of its main line, the road has a more highly developed road as indicated than those neighbor roads,

for instance, by the fact that the main line for years has been completely equipped with automatic block signals, by the greater proportion of permanent bridges, by the more solidified or better ballasted roadbed, etc.

Earned \$8.07 per Share in 1926

The Northern Pacific, in 1926, reported its best year since 1921 from the standpoint of its net after interest and other charges and its best year since 1917 from the standpoint of its net earnings from its railroad operations. The net after charges totaled \$21,002,732 as compared with \$17,944,288 in 1925, the net income being equal to \$8.07 a share on the capital stock while in 1925 net income equalled \$7.24 a share. Prior to the war the railroad paid 7 per cent dividends, but, since May, 1922, it has paid only 5. The stock is at present selling at about \$87 a share giving a yield at that price of 5.75 per cent. The 1926 earnings per share would be equivalent to earnings of 9.28 per cent on the present selling price. Thus far in 1927 the road has not done as well as it did in 1926. The net railway operating income for the first three months reported last week was \$2,291,055 for 1927 as against the figure for the first three months of 1926 of \$3,284,582.

Decrease in Traffic Since 1916

The statement has been made on several occasions with reference to the adverse economic conditions of the Northwest that the railroads which have a greater interest in the western part of the territory have had rather a less favorable break from the standpoint of traffic volume than has been the case with the roads having their interest primarily in the eastern part of the region. This appears particularly to be the case with reference to the Northern Pacific, and when all is said and done it is only too evident that one of the chief handicaps that the railroad has been suffering in recent years has been its lack of traffic.

The northwestern roads as a whole have not had increases in traffic in recent years comparable with those in other regions of the country. In the case of the Northern Pacific there has, however, been no increase at all; instead, there has been a decrease. The 1926 revenue ton-miles of the Northern Pacific were 1.66 per cent less than in 1925, but they were also less than for any year since 1916 with the exceptions only of 1921, 1922 and 1924. As compared with the fiscal year ended June 30, 1916, selected as being the middle year of the test period, the 1926 revenue ton-miles showed a decrease of 5 per cent. In the case of the northwestern region, the 1926 revenue ton-miles showed an increase of 10 per cent as compared to that year; the western district as a whole showed an increase of 32 per cent and the railroads of the United States an increase of 30 per cent.

Inadequate Rates

It is now nearly universally agreed that the great difficulty with the northwestern railroads is unfavorable

rates, but it would appear in the case of the Northern Pacific that the unfavorable rate structure can only be half the story because there is superimposed the handicap of lack of traffic. It naturally follows that a railroad equipped to handle its business in 1916 and which has spent large sums of money improving that property in the 11 years since, cannot be expected to prosper if in addition to receiving inadequate rates it has also had to contend, over the period of ten years, with a falling off in its business.

The situation with reference to rate structure is shown by a comparison as between the 1926 averages and those for the year ended June 30, 1916. The Northern Pacific handled its 1926 revenue freight traffic with a revenue per ton-mile of 1.148 cents which compared with the average revenue per ton-mile in the western region of 1.125 cents. The Northern Pacific's higher revenue per ton-mile is presumably explained by its proportionately small mileage in western trunk line territory and by its somewhat higher grade of traffic. For example, its coal tonnage constitutes only about 15 per cent of its total tonnage and ore tonnage, which forms a large proportion of the traffic of some of the other Northwestern roads, constitutes only 5 per cent. It does, however, handle a large tonnage of products of forests, the 1926 percentage of total tonnage being 38. It is this higher grade of traffic and the lumber which now tends to move through the Panama Canal rather than all-rail as formerly. As compared with 1916, the increase in the Northern Pacific's revenue per ton-miles was 45 per cent. This was the same as for the northwestern region. It compared with an increase of 41 per cent for the western district but on the other hand the increase for the Class I railroads as a whole was 53 per cent. An increase of 45 per cent in the revenue per ton per mile since 1916 is hardly adequate recognition of the increase in costs of running a railroad that has taken place in the period intervening.

Net Operating Income Only

81 Per Cent of Standard Return

As a result of the combination of inadequate rate relief and of decreased traffic, the Northern Pacific's net railway operating income in 1926 was 19 per cent less than its standard return or average annual net railway operating income for the three years ended June 30, 1917. The figures show that the net railway operating income in 1926 was \$24,213,700 which compared with standard return of \$30,057,760 and which was, therefore, 81 per cent of the standard return. In the case of the northwestern region the 1926 net railway operating income was 88 per cent of the standard return. In the case of the western district, the percentage was 112. In the case of the Class I railroads as a whole it was 136.

Since December 31, 1915, the Northern Pacific has expended \$98,645,137 on additions and betterments to its property which amounts to about \$40 a share on the present outstanding capital stock and which is of interest because in the same period, not counting the increase in

Table I—Northern Pacific Operating Results, Selected Items, 1916 to 1926

Year	Mileage	Revenue ton miles	Revenue passenger miles	Rev. per ton mile cents	Total operating revenues	Total operating expenses	Net operating revenues	Operating ratio	Net railway operating income	Net after charges
1916	6,508	7,721,586,000	591,521,000	0.771	80,281,343	43,232,278	37,049,065	53.85	33,446,012	26,948,011
1917	6,523	8,812,675,000	660,713,000	0.741	88,225,726	53,297,861	34,927,865	60.41	30,491,140	29,502,686
1918	6,599	9,589,273,000	672,985,000	0.819	102,908,259	73,850,968	29,057,291	71.76	24,217,342	20,129,334
1919	6,592	7,589,036,000	748,636,000	0.961	100,739,354	78,672,509	22,066,845	78.10	14,368,479	22,836,737
1920	6,653	7,852,848,000	719,446,000	1.033	113,084,408	100,983,874	12,100,534	89.30	7,949,458	19,094,183
1921	6,658	5,289,784,000	505,702,000	1.309	94,538,059	77,630,867	16,907,192	82.12	10,843,826	22,065,399
1922	6,641	6,021,159,000	473,992,000	1.191	96,076,066	72,654,711	23,421,355	75.62	19,450,514	15,056,930
1923	6,669	6,854,337,000	479,515,000	1.132	102,002,060	80,364,810	21,637,250	78.79	17,100,557	12,981,426
1924	6,680	6,548,671,000	413,117,000	1.121	95,292,404	70,533,064	24,759,340	74.02	19,861,077	15,970,244
1925	6,694	6,751,142,000	426,515,000	1.130	97,864,555	69,972,476	27,892,078	71.50	22,227,319	17,944,288
1926	6,682	6,639,160,000	406,628,000	1.148	97,351,042	68,260,944	29,090,098	70.12	24,213,700	21,002,732

Standard return for operations during federal control, \$30,057,760.

debt due to the refunding of the Northern Pacific-Great Northern (C. B. & Q. collateral) joint 4's in 1921, the total debt outstanding in the hands of the public decreased \$4,751,900. This means, of course, that this \$98,000,000 has been invested without compensation in the way of any increased return in net operating income whatsoever although it has enabled the road to effect large economies in operation without which its net operating income within recent years would have been still less. It also develops that in 1926 the Northern Pacific had a rate of return on its railway property investment including materials and supplies and cash of 3.96 per cent. It might also be pointed out that even according to the tentative valuation by the Interstate Commerce Commission plus additions and betterments since the date of valuation and including other investments, there was, at the end of 1926, an excess of property over capitalization of \$187,000,000. The Northern Pacific is not earning a fair return on its property. The stockholder, however, is fortunate in that he has sufficient equity in the property so that even with its adverse conditions and with a rate of return on its property investment of only 3.96 per cent, the road can still earn \$8 per share and in such a year as 1926 pay its dividend requirements of 5 per cent, totaling \$12,400,000, and still have a balance after dividends of \$8,600,000.

Transportation Ratio of 33.2

It would appear also that there is in the Northern Pacific a certain equity, if such it might be called, of operating efficiency. This is indicated by the following table showing the ratios of operation in 1926:

Per Cent of Total Operating Revenue, 1926

	Northern Pacific	Great Northern	C. B. & Q.	North-western Region	Western District
Maintenance of way ..	12.6	12.0	14.8	14.1	14.3
Maintenance of equipment ..	17.9	15.2	18.7	19.0	18.7
Transportation ..	33.2	31.8	33.7	35.5	33.5
Total expenses ..	70.12	64.1	72.2	73.90	71.97
Ratio of net operating income ..	24.9	26.7	18.6	18.0	19.4

It will be observed that the road had an operating ratio of 70.12, which while not as good as that of the Great Northern, nevertheless, compared with 73.90 for the northwestern region and 71.97 for the western district. It will also be observed that the 1926 transportation ratio to total operating revenues was 33.2. Even the Great Northern did not better that greatly with its figure of 31.8 while the northwestern region reported a figure of 35.5 and the western district one of 33.5. The remarkable feature of the transportation ratio in 1926 was that the 33.2 per cent shows an increase of only one point over the 1917 ratio of 32.2. This part of the record would seem to indicate that the Northern Pacific management has succeeded in controlling its operating expenses in an unusually skilful manner. The fact that it has been unable to keep its total operating ratio on the same parity with its 1917 results—70.12 in 1926 as compared with 60.41 in 1917—will be found to have resulted from the higher maintenance expenses in 1926 and the higher prices for material and labor.

Another test is the relationship of net railway operating income to total operating revenues. In this respect the Northern Pacific seems to stand unusually well. Its 1926 figure was 24.9, which is noteworthy because it compared with a total of 18.0 per cent for the northwestern region or with 19.4 per cent for the western district; even the prosperous Union Pacific reported a figure of no better than 20.5. The Great Northern was so well favored, even though it is a northwestern railroad, that it reported a figure of 26.7, thereby bettering the Northern Pacific's total. Even the prosperous Santa Fe could

do no better than a ratio of net railway operating income to total operating revenues of 25.5

Operating Statistics

There are given with this article the usual tables (Table I, the trend of operating results for the past ten years and, Table II, the comparison of operating statistics). In the case of the latter, the Northern Pacific figures for 1926 are compared with 1920 as has been the rule in previous articles. It will be noted that while the Northern Pacific in 1926 as compared with 1920 had a decrease in its gross ton-miles of 0.6 per cent, it succeeded in decreasing its freight train-miles by 14.8 per cent and its freight train-hours by 21.2 per cent. It secured this result by an increase of 16.5 per cent in its

Table II—Comparison of Selected Freight Operating Statistics

	NORTHERN PACIFIC		Per cent of change	
	1926	1920	Inc.	Dec.
Mileage operated	6,510	.....	...	...
Gross ton-miles (thousands) ..	18,067,463	18,178,888	...	0.6
Net ton-miles (thousands) ..	7,921,550	8,860,205	...	10.6
Freight train-miles (thousands) ..	10,037	11,765	...	14.8
Freight locomotive-miles (thousands) ..	11,167	13,299	...	16.0
Freight car-miles (thousands) ..	470,840	459,561	2.5	...
Freight train-hours ..	787,249	997,805	...	21.2
Tons of coal consumed by freight locomotives ..	1,453,190	1,495,937	...	2.8
Car-miles per day ..	29.4	32.9	...	10.6
Net tons per loaded car ..	24.2	27.3	...	11.4
Per cent loaded to total car-miles ..	69.5	70.6	...	1.1
Net ton-miles per car day ..	495	634	...	21.9
Freight cars per train ..	47.9	40.0	19.8	...
Gross tons per train ..	1,800	1,545	16.5	...
Train speed miles per train-hour ..	12.7	11.8	7.6	...
Net tons per train ..	789	753	4.8	...
Gross ton-miles per train-hour ..	22,950	18,219	26.0	...
Net ton-miles per train-hour ..	10,062	8,880	13.4	...
Loco-miles per loco-day ..	47.4	54.8	...	13.5
Per cent freight locos. unserviceable ..	21.1	21.3	...	0.2
Per cent freight cars unserviceable ..	6.8	8.5	...	1.7

gross tons per train and by an increase in its average train speed to 12.7 miles per hour or by the combined results shown in an increase of 26 per cent in the gross ton-miles per train-hour. The increase in the case of the gross ton-miles was not as great as in the northwestern region, 37.3 per cent, or in the western district, 43.6 per cent. Notwithstanding this the Northern Pacific's gross tons per train, the net tons per train, the gross ton-miles per train-hour and the net ton-miles per train-hour are still higher than the average of the region or the district.

Conclusion

The impression one gets generally of the Northern Pacific is that the road is in a position to handle efficiently a very greatly increased volume of traffic and that if it had this increase in traffic it would carry a very large proportion of the resulting increase in gross to its net income. Naturally, the future of the railroad depends almost entirely upon the region which it serves but it is at least true that the stockholders and the management have done their part toward meeting any future needs for service that may arise over a considerable period of time.

THE LOS ANGELES DIVISION of the Southern Pacific has been awarded permanent possession of a silver trophy cup for the greatest improvement in fuel conservation on that railroad during the first quarter of 1927. This division, under the direction of G. E. Gaylord, superintendent, has won three of the last four trophies offered by the company.

New Ideas in Station Work Considered by Freight Agents

Annual session at Memphis marked by interesting committee reports and illuminating addresses



Michigan Central Freight Platform, Detroit, Mich.

MORE than 500 members were in attendance when the seventh annual meeting of the Freight Station Section of the American Railway Association was opened at Memphis, Tenn., on May 17, by Chairman Frank Laughlin, agent, Erie, Cleveland, Ohio. Following the usual preliminaries, the meeting was addressed by Fred D. Beneke, president of the Memphis Rotary Club, who spoke on "Flood Conditions." In the absence of R. H. Aishton, president, American Railway Association, an address on the adjustment of freight claims was delivered by Fred E. Winborn, special agent of the Freight Claims division, A. R. A., while J. F. Porterfield, general superintendent of transportation, Illinois Central, spoke on "Increased Car Utilization." Carl Nyquist, vice-president, Chicago, Rock Island & Pacific, spoke on Wednesday morning on the importance of the prompt collection of transportation charges, and the part of the agent in the collection. In the afternoon Joe Marshall, special representative of the Freight Claim Division, A. R. A., spoke of the intensive campaign being waged against loss in transit, and the agents' part in aiding it. J. L. Donohue, general claims attorney, Louisville & Nashville, addressed the meeting on the part of the local agent in public relations and W. H. Gatchell, assistant to the vice-president, Southern, gave, informally, a "Short Talk With My Local Station Friends."

At the election of officers, George B. Ingersoll, agent, Wabash, Chicago, Ill., was elected chairman. Other officers elected were: first-vice-chairman: J. H. Rogers, agent, Long Island, Long Island City, N. Y.; second vice-chairman: W. H. George, agent, Chicago & Alton, East St. Louis, Ill.

The report of the Committee on Operating was presented by Chairman J. R. Hitchcock, assistant agent, Atchison, Topeka & Santa Fe, Kansas City. In connection with the recommendation of the association that a special form of waybill for carload perishable freight be provided, the committee reported that upon its repre-

sentations to the Railway Accounting Officers' Association, that association inserted in its 1927 year book a provision to the effect that it is desirable to use a special color of way bill for perishable freight. The committee found, however, that even where these forms are used they are not always used properly and recommended to the association that care be taken to see that all re-con-signing stamps are legible.

The committee further recommended that each agent prepare a manual of instructions covering the operation of his station, so that the employees may learn more readily how the work of the station is conducted and the manner in which the work assigned to the different positions at the station should be done. The practice of placing all necessary instructions in the hands of employees was approved.

In connection with the collection of charges for disinfecting stock yards, pens, chutes, etc., that have been quarantined on account of diseased stock, it was recommended that individual railroads establish a fixed charge per square yard of surface for disinfecting these facilities, such charge to be based on the cost of the disinfectant required and the labor and supervision necessary; and that agents at all points where there are railroad stock pens be supplied with blueprints showing the dimensions in square yards of the stock facilities. Under this plan, when the diseased condition of the stock is determined at the first unloading point, the agent can arrive at the cost

immediately and, if the shipment is destined to another point, protect the charges on the waybill. When the diseased condition is not discovered until after the stock has arrived at some other point, advice can be wired promptly to agents at previous unloading points that the pens must be disinfected. The agents at such points can then wire the cost per square yard at once, advising the agent at the point where the diseased condition was discovered what charges to assess.

Station Traffic

The Committee on Station Traffic, of which J. A. Williams, agent, Chicago & North Western, Chicago, was chairman, submitted a final report based on replies received from a questionnaire on the use of a standard form of shipping orders and bills of lading and the better making out by shippers of these documents. The report stated that commodities are printed on over one-half of the bills of lading examined, while shipping orders not conforming to the design described by the Interstate Commerce Commission represented 17.3 per cent of the total examined. The shipping orders of less than standard size amounted to 41.5 per cent. Of the illegible shipping orders, representing 5.9 per cent of the total examined, poor writing represented 1.7 per cent, poor carbon 1.6 per cent, bad alignment 1.7 per cent and excessive abbreviation 0.9 per cent. The committee felt that the individual agents should bring such illegible shipping orders to the attention of the shippers to bring about an improvement. This recommendation also applies to shipping orders where the description of the shipment was in error, which represented 3.4 per cent of the total. Summarizing the questionnaire, the committee found that the percentage of items that may be classified as real violations is extremely small and that no alarming conditions exist at this time. The committee recommended, however, that there be no laxity of vigilance in this respect. A letter was presented to the association from the National Industrial Traffic League, addressed to all its members, calling attention to the necessity of making out shipping orders and bills of lading properly.

As to the loss of revenue and additional labor resulting from advancing, for collection from consignee, charges billed out by shippers, the committee found there are numerous exceptions within the rule. However, in the opinion of the committee, the source of trouble cannot be eliminated and it was its recommendation that the agents adjust themselves to the change in the methods of transacting the commercial business of the country.

The committee concurred in the recommendation of the Demurrage Committee of the Transportation division as to sending notices to shippers of unclaimed carload freight. The recommendations of the Demurrage Committee include speeding up the notification to the shipper when freight is refused at destination.

Chairman R. K. Wilson, agent, Florida East Coast, Miami, Fla., presented the report of the committee on Station Accounting. In connection with the possibility and desirability of handling and accounting for carload and less carload freight without the use of a revenue waybill, the committee found that there were weaknesses in all of the schemes advanced for this purpose. The chief difficulty is that such schemes required prepayment of freight charges on all shipments. It is found quite difficult now to determine correct charges on prepaid shipments and the difficulties would be greatly multiplied if all shipments had to be prepaid. The simplification of tariffs and classifications would be hampered and every station would have to have men who were competent to read and interpret them. Much freight is now forwarded without being weighed at point of origin, necessitating

weighing at destination. If shipments were prepaid, it would be necessary to provide facilities at all originating stations to weigh shipments. While the committee is of the opinion that if such a plan could be successfully worked out, it would be highly desirable—they have not yet found such a plan that would work efficiently or be an improvement over the present practice.

As to uniform methods of waybilling miscellaneous charges accruing in transit, the committee recommended that the present plan of making advance only waybills should be continued and that agents and auditors should carry on a vigorous campaign to insure proper notation of miscellaneous charges being made on the original revenue billing. Present overcharge claim rules amply protect the destination carrier in the event other carrier's agents fail to put the proper notation on revenue billing.

The committee recommended that the matter of correcting prepaid charges be referred to the Railway Accounting Officers Association with the endorsement of the Freight Station Section that these rules be changed so as to permit the agent at the junction point to revise the billing and correct the prepay, paying the connecting carrier the full amount of prepay to destination unless there is information on the waybill to indicate that the amount prepaid is to apply and that any balance due is to be collected from the consignee.

Handling Perishable Freight

In reporting on changing the character of protective service enroute, particularly shipments packed in ice, the Committee on Perishable Freight, of which E. H. Osterhout, assistant agent, Atchison, Topeka & Santa Fe, Chicago, was chairman, stated that it was unable to find in its investigations that such practice has proved dangerous. Experience has shown that where a change in the character of protective service has been made on shipments carrying ice in the body of the car or in packages, and heat substituted for refrigeration, the ice has been a benefit and protection rather than the reverse, while there is some risk of damage to shipments during extremely low temperatures because of hatches having to be kept open during the removal of ice from the bunkers. The committee had a report from the Freight Claim division to the effect that a thorough investigation has been made to ascertain the extent to which claims have been presented and paid because of damage resulting from changing the protective service enroute and they have been unable to find that any claims had been allowed on that account.

Chairman W. A. Bartlett, agent, Chicago, Burlington & Quincy, Peoria, Ill., submitted the report of the activities of the Committee on Freight Claim Prevention. This committee has issued freight claim prevention circulars during the year and held joint meetings with the Freight Claim Prevention committee of the Freight Claim division at several sessions.

The committee expressed itself as heartily in favor of educating the staff as to correct and incorrect methods of loading freight by means of photography and recommended that photographs be taken of cars both wrongly and rightly loaded and stowed and of packages in proper and improper containers. These photographs could be used also for convincing shippers when their methods of loading various commodities are wrong and securing their co-operation for better loading.

The committee also favored serially numbering packages and other articles shipped by freight to prevent loss, particularly numbering of cases and other containers in which a diversified list of articles is packed or shipments consisting of a number of cases or containers of one article made up of various sizes and values. The contents

of each serially numbered case should be recorded on the shipper's order blank from which the shipment is packed and on the invoice sent to the consignee, as well as on the bill of lading and the railroad waybills. The committee believed that this system would enable consignees to check the goods more quickly with invoices as they are unpacked and would enable them to identify at once the exact articles in any cases which might be short. This system would also assist agents in station over and short work. This was recommended as a cure for the increase which amounted to more than 5 per cent in claims for losses of entire packages last year.

The committee recommended that agents at terminals where there is a Committee of the Claim Conference should establish contact with this committee and also with shippers' advisory boards, co-operating with them.

The committee made a particular study of the reason for increases in loss and damage claims on furniture and household goods and recommended, among other things, that agents use every effort to have shippers mark each individual package and, further, to aid shippers in every way in packing their goods properly. The committee gave in detail the recommendations of two railroads dealing with the handling of household goods. The committee further recommended the use of wire and steel band strapping instead of wood blocking in carload shipments of barrels and other commodities where it can be used to advantage. Due to investigations made by the Western Weighing and Inspection Bureau, this method was claimed by the committee to be beyond the experimental period and thoroughly satisfactory.

A special committee, of which C. T. Spear, agent, Chicago, St. Paul, Minneapolis & Omaha, Chicago, was chairman, reported on handling shipments in bond when billed shipper's order. The report indicated that the subject had been taken up with the chief of the Customs division of the Treasury Department by the general counsel of the American Railway Association, but found that the Customs department was disinclined to approve the recommendations of the Freight Station Section. Further negotiations were being conducted through the general counsel of the American Railway Association.

In addition to the reports of the committees, 25 special papers were presented by the sectional committees dealing with freight station work, copies of which may be obtained from the secretary of the section, R. O. Wells, agent, Illinois Central, Chicago.

Increased Car Utilization

On Tuesday afternoon, J. F. Porterfield, general superintendent of transportation, Illinois Central, addressed the meeting on "Increased Car Utilization."

The greater utilization of the freight car challenges the attention of the Freight Station Section. As you know, this is one of the few ways in which railway operation has shown no progress in recent years. In fact, freight service operations for 1926 compared with those of 1920 show an actual decrease in the average car load. During this seven-year period the capacity of the average freight car in use on the railroads of the United States increased from 42.4 to 45.3 tons, a net increase of 2.4 tons, or 7 per cent. During the same period, however, the average load per car decreased from 29.3 to 27.4 tons, a net decrease of 1.9 tons, or 6 per cent.

This means that only 60 per cent of the carrying capacity of the average freight car is now being utilized and that 40 per cent of the car's capacity is now being wasted. It means that the average freight car moved by the railroads in 1926 was loaded approximately 18 tons short of its maximum capacity. It means that the average freight car owned by the railroads in 1926 was capable of moving 400 tons of freight more than it actually did move during the year. When we consider the total freight movement in 1926, we find that, without increasing freight train movements, the railroads were theoretically capable of handling 954,000,000 tons of freight, or 195,000,000,000 ton-miles of freight, more than they actually handled.

These figures illustrate the possibilities in the way of greater utilization of freight cars. It is a well-known fact, however, that there are some commodities which cannot be loaded to the full carrying capacity of the cars, and there are many other cases when it would not be economy from either the shippers' or the railroads' standpoint to load to capacity. Nevertheless, there is ample opportunity for improvement. If, for example, the tonnage of the average car loaded in 1926 had been increased to the extent of only one ton, it would have been equivalent to adding to the equipment of the railroads 84,000 freight cars representing a capital investment of \$210,000,000; if the tonnage of the average car loaded had been increased to the extent of two tons it would have been equivalent to adding to the equipment of the railroads 168,000 freight cars representing a capital investment of \$420,000,000 and so on.

The decrease in the average car load is attributed to several causes, the principal one probably being the substantial increase in proportion of the lighter loading commodities, such as those coming under the classification of l. c. l. merchandise and manufactured and miscellaneous commodities, as well as of certain manufactured agricultural products: flour, feed and the like.

Another and a related cause of the lighter car loading of the present, however, is the tendency of merchants, manufacturers and others to buy in smaller quantities than they formerly did. This hand-to-mouth tendency may be due in part to the fact that the buyers and shippers generally have greater confidence than ever before in the ability of the railroads to effect prompt deliveries, and to that extent it is a compliment to railway service. Railway performance in recent years has improved so noticeably, and it is now so uniformly prompt and dependable, that buyers are not put to the necessity of laying in heavy stocks of goods to provide against slow deliveries, car shortages, strikes, freight embargoes and other delays which were of such frequent occurrence in the past.

Since 1920 there has been an increase of 38 per cent in the number of cars loaded annually with l. c. l. merchandise. One out of every four cars loaded by the Class I railroads of the United States last year was employed in the movement of l. c. l. merchandise, yet such cars carried less than one-twentieth of the total tonnage moved by the railroads and they produced less than one-tenth of the total railway freight revenue. The percentage of net to gross tonnage handled in this manner was only 12 per cent. In other words, 88 per cent of the tonnage moved represented car weight.

The opportunity for increasing car utilization and effecting substantial economies in handling l. c. l. freight can readily be seen from these figures.

The number of cars loaded with commodities coming under the classification of manufactures and miscellaneous has increased 16 per cent since 1920. The average quantity loaded in each car is now about 26 tons, or 49 per cent, leaving 51 per cent as car weight. In arriving at these percentages of net to gross I have used box cars, the operation of this class of equipment having the greatest percentage of loaded to total miles.

Competition in the movement of merchandise and miscellaneous manufactured products is keener today than ever before, due largely to the growing use of the motor truck. This keen competition is probably responsible for the greatly increased use of cars for the handling of l. c. l. shipments. On the Illinois Central System we have been forced to add many l. c. l. cars in order to meet competition for earlier deliveries.

From these facts, it will readily be seen that there is a real opportunity for increasing car utilization, reducing transportation costs and increasing the operating performance of the railroads through increasing the car load. Here is a problem for railway freight agents, who are responsible for efficient and economical operation and who in the solicitation of freight traffic are in closer touch than any other class of railway representatives with the shipping public. The freight agent is in better position than any one else to accomplish the end so much to be desired—the greater utilization of freight car capacity.

Carl Nyquist, vice-president, Chicago, Rock Island & Pacific, in his address on the importance of prompt collection of transportation charges said:

The greater part of this revenue is immediately turned back into operation channels, and it follows that the prompt collection of freight charges and other transportation revenues is the very basis of all railroad operation. Under the present system the agent plays a vital part in such collection. He is usually the man who must decide the credit standing of the consignee, the man upon whom in a large measure the whole problem rests.

Attempts are being made in some quarters to abrogate the present collection rules. These regulations, which require the collection of all charges within 48 hours after delivery, or in special cases, 98 hours, have been tried and proved in the past eight years, and changes at this time will be of doubtful value.

K. C. S. Merger Plan Rejected

Financial pyramid disapproved by majority of Interstate Commerce Commission

THE Interstate Commerce Commission, by a vote of 7 to 4, on May 4 vetoed the plans of L. F. Loree and associates for the formation of a new southwestern railroad system, the decision being announced on May 19. The applications of the Kansas City Southern for authority to acquire control of the Missouri-Kansas-Texas and of the latter for authority to acquire control of the St. Louis Southwestern, by purchase of stock, were denied as not being in the public interest.

While the majority finds that the proposed union of the three carriers "has commendable features," and that there is room for another major system in the Southwestern-Gulf region, the plan is disapproved, as was the proposed Nickel Plate unification last year, on financial grounds. From a transportation standpoint it is described as possessing both important advantages and serious disadvantages, but the control of properties so large by such a relatively small amount of capital is declared to be not in the public interest.

Commissioners Meyer, Hall, Lewis and Woodlock dissented, objecting vigorously to the negative policy followed by the majority, and contending that any objectionable features of the plan should be required to be corrected instead of denying it. Commissioner Woodlock declared it to be the plain duty of the commission to reopen the case, and even the majority report contains some indication that a plan for the formation of a system under control of the M.-K.-T., instead of the Kansas City Southern, might have been approved.

About \$25,000,000 of common stock of the K. C. S., having a market value last November of less than \$11,000,000, or less than two per cent of the aggregate book assets of the three companies, could effectively control all of them, the report says, adding that "this seems too small a base upon which to build such a financial pyramid," and that "if a sound transportation agency is to be created by a combination of the three lines herein considered, it would seem that the largest carrier, the M.-K.-T., instead of the smallest, should be made the center of the system."

The report says that practical control of the M.-K.-T., and St. L.-S.W., was exercised before the filing of the application for the commission's approval, and doubt is expressed as to whether this did not constitute a violation of the anti-trust laws. However, although the same point is also involved in other cases, the commission fails to give a decision on it in view of its disposition of the application for other considerations.

Another point made is that the proposed plan of control affords no proper protection to the minority stockholders of the M.-K.-T., and Cotton Belt and the price paid for preferred stock of the latter is criticized as being too high, although it is stated that the prices paid for the M.-K.-T. stock are not regarded as necessarily excessive.

Evidence presented by the applicants regarding many of the operating savings to be accomplished is characterized as "conflicting" and lacking in convincing force.

The conclusions expressed by the majority are in part as follows:

WASHINGTON, D. C.

Conclusions of the Majority

There is something incongruous in the control by one carrier of another having more than three times its mileage and more than twice its resources, and when there is added indirect control of a third carrier, also larger than the controlling corporation, the incongruity and lack of proportion is accentuated. The book liability of the capital stock shown by the three lines, including the no-par-value common stock of the M.-K.-T., is about \$201,000,000, and if the \$54,000,000 of adjustment bonds of the M.-K.-T. should be converted into preferred stock of that company it would be about \$255,000,000. The market value of all this stock at New York on November 13, 1926, the day of the close of the hearing, was about \$103,000,000, and if the M.-K.-T. adjustment bonds should be converted into stock the total market value, based on prices of that date, would be about \$153,000,000. It is shown that, as of May 31, 1926, the total recorded assets of the M.-K.-T. were \$304,230,459 and of the Cotton Belt \$152,093,992, and that, as of April 30, 1926, the total assets of the K. C. S. were \$141,737,277, making a total for the three companies of \$598,061,728. The outstanding capital stock of the K. C. S., as above noted, is about \$51,000,000, divided into \$21,000,000 of preferred and about \$30,000,000 of common stock. The market price of the common stock on November 13, 1926, was \$43 and of the preferred \$64.50 per share. About \$25,500,000 par value of its common stock could effectively control the company, and the market value of this amount of stock on November 13, 1926, was less than \$11,000,000, or less than 11 per cent of the market value of all the stock of the three companies, about 7.2 per cent of the total value of the stock if the M.-K.-T. adjustment bonds should be converted, and less than 2 per cent of the aggregate amount of their book assets.

This seems too small a base upon which to build such a financial pyramid. There are too many possibilities of the misuse of power lodged in the hands of a small group of stockholders whose financial interest in the enterprise may be very small. One such situation was considered by us in our Report on *Financial Transactions C. R. I. & P. Ry. Co.*, 36 I. C. C. 43.

Again, we have serious doubt whether the use of the funds required to carry out the applicants' plans is in the public interest. * * * More than \$35,000,000 will have to be expended by the two carriers in purchases of stock. The natural effect will be to postpone for a time the issue of further capital obligations. The use to so large an extent of current funds which may be needed for other purposes is, we think, not justified.

Roads to Be Operated Separately

Some additional extracts from the discussion of the plan follow:

Under the proposed plan of association the three roads are to be operated separately as heretofore. It is also indicated that they will continue to compete with one another at points where they now compete and in much the same manner. The three carriers are, however, to combine certain of their resources and facilities to form a new railroad system, which will compete with the other railroad systems in the Southwestern-Gulf region. It seems reasonable to conclude that this system competition will be about the only competition afforded. The competition between lines under common control and operated in a common interest can not well be either strong or reliable. Moreover, the preservation of the independence of the three carriers and the maintenance of their respective competitive relations towards one another are incompatible with the realization of many of the economies which the applicants claim will result from the combination.

Of the competitors, the only distinctly Southwestern-Gulf systems are the Missouri Pacific and the Frisco, the others having their mileage and interests largely outside of this region. The proposed system would compare favorably in extent and distribution of lines with the other major systems in that territory and would have substantially all its mileage within this region.

In our tentative plan set forth in *Consolidation of Railroads*, only two primarily southwestern systems were contemplated, viz: No. 18, the Frisco-M.-K.-T.-Cotton Belt, and No. 19, the Chicago-Missouri Pacific; although No. 16, the Santa Fe, and No. 17, the Southern Pacific-Rock Island, included much mile-

age in that territory * * *. We do not think that the formation of this distinctively Southwestern-Gulf system is objectionable *per se*. It would be on a reasonable financial parity with the other systems operating in the Southwestern-Gulf region.

It is represented that the combination of the three carriers into a new system as proposed is necessary for their mutual protection. It will lie in the power and be to the interest of competing major systems to add to their own business and revenues at the expense of their weaker competitors.

* * * The record affords little support to applicants' contention that they are menaced with serious loss of traffic to their competitors. There is comparatively little interchange of traffic between the three carriers of the proposed system, as shown by the following figures which relate to the year 1925. The K. C. Southern received from the M-K-T 49,236 tons and delivered to it 70,677 tons. It received from the Cotton Belt 58,191 tons and delivered to that road 123,799 tons. Its total interchange with all carriers was 3,357,438 tons received and 3,050,356 tons delivered. The M-K-T system received 71,907 tons from and delivered 51,159 tons to the Cotton Belt system. Its total interchange with all carriers was 5,169,880 tons received and 5,461,103 tons delivered. The total interchange of the Cotton Belt with all carriers was 2,788,690 tons received and 2,699,715 tons delivered. It thus appears that of the total tonnage which the K. C. Southern received from and delivered to its connections, 3.2 and 6.4 per cent, respectively, were received from and delivered to the M-K-T and Cotton Belt; that of the total tonnage which the M-K-T received from and delivered to its connections, 2.8 and 1.9 per cent, respectively, were received from and delivered to the K. C. Southern and Cotton Belt; and that of the total tonnage which the Cotton Belt received from and delivered to its connections, 6.3 per cent and 4.9 per cent, respectively, were received from and delivered to the K. C. Southern and M-K-T.

Testimony on behalf of the applicants is to the effect that the proposed acquisitions of control would increase the interchange of business between and improve the traffic diversity of the constituent lines and enhance their revenues. * * * An estimate was made that this increased interchange of traffic would produce additional income to the roads of the system and that the annual increase in the revenues therefrom would be \$390,177 for the M-K-T, \$346,605 for the K. C. S., and \$178,410 for the Cotton Belt or \$915,192 for the three lines. The evidence in support of these estimates was not convincing, and from other testimony introduced by applicants it appeared that they do not expect a great increase of interchange between the carriers of the proposed system but hope to draw more traffic from other roads. The lines of these three carriers are parallel to only a limited extent. * * * The lines complement and supplement each other in that each in some regions practically extends the lines of one of the others or forms with them practicable routes of traffic. The K. C. S., for example, extends the line of the Cotton Belt from Shreveport to Port Arthur. The lines of the Cotton Belt in northern Texas extend the lines of the M-K-T to Texarkana and Memphis and in conjunction with the K. C. S. extend them to Port Arthur. The lines of the M-K-T extend the lines of the Cotton Belt into western Texas and Oklahoma, and on the north the lines of the M-K-T extend the K. C. S. to St. Louis.

Although there is strong competition between the M-K-T and the Cotton Belt on traffic moving between northern Texas and St. Louis, or through the St. Louis gateway, and also strong competition between the M-K-T and the K. C. Southern in many places, the testimony shows that for a large portion of their traffic these roads are not competitors. A certain amount of interference with competition is involved in nearly every railroad combination that may be formed, but if this interference is not unduly great, and particularly if the tendency of the combination is to increase and promote other competition to compensate for that destroyed or lessened, the combination may well merit our approval, if it is otherwise shown to be in the public interest.

Some operating economies that might be effected through the combination of the three carriers in the manner proposed are specified. Those to result from possible reductions of grades are perhaps the greatest. Some of the proposed operating economies might theoretically be realized through inter-company agreements or arrangements apart from common control. Some of the economies would doubtless be realized. That to result from the joint use of terminal facilities would perhaps produce the greatest immediate saving.

The evidence introduced by chambers of commerce and by shippers seemed more generally to favor approval of the applications, although there was strong objection in some localities. St. Louis and Kansas City interests favored it, as did numerous organizations and shippers in Kansas, Arkansas and Texas. There was considerable opposition from Waco, Beaumont and Port Arthur, Tex., and from shippers along the line of Waco,

Beaumont, Trinity & Sabine Railway. Some Waco interests fear the loss of competition between the M-K-T and Cotton Belt on traffic to and from St. Louis and beyond. Beaumont and Port Arthur interests want another line to compete with the K. C. S. and fear that the union of the M-K-T with the K. C. S., as proposed, would assure the perpetuation of the "monopoly" which the K. C. S. now has. They would like to have the M-K-T take over the Waco, Beaumont, Trinity & Sabine, hereinafter called the Waco, and extend it to Beaumont and Port Arthur to compete with the K. C. S. The Waco, and R. C. Duff, its president, strongly oppose the union of the M-K-T with the K. C. S. in the manner proposed.

Several other short lines intervened in the proceedings. Some feared that the proposed combination would cause the diversion of traffic from their lines and some were anxious to be included in the proposed combination. * * * The applicants urged that the allocation of short lines to the large systems should be made by us in a proceeding to which all those systems operating in the Southwestern-Gulf region, as well as the short lines, are made parties.

In view of the disposition which we find it necessary to make of these applications, it is deemed unnecessary to discuss further in this report the contentions of the short lines.

Advantages and Disadvantages

from a Transportation Standpoint

There is room, in our opinion, for another major system in the Southwestern-Gulf region. The proposed system, with lines running to all important traffic points, would be well equipped to meet competitors on even terms. The competition between it and the other large systems in the region would go far to make up for the loss of competition between its parts which would result from the association proposed.

But the proposed system would have serious disadvantages. * * * It is charged by protestants that the applicants have already practically secured the control and that by so doing they have violated the statutes. It is also suggested that such acquisitions of actual or potential control without first securing our approval and authorization were in contempt of our authority. It appears that the K. C. S. dominated the other carriers of the proposed system before its application was filed. We doubt that such preliminary ascendancy was necessary or conducive to the fixing of equitable terms of union. If a project is fair in its provisions it should not be necessary that one be put in a dominant position before applying.

If the effect of this practical control of the M-K-T by the K. C. S., and of the Cotton Belt by the same company, under the agreement of July 23, 1926, is to acquire the 155,000 shares of Cotton Belt stock may be substantially to lessen competition between these carriers, and that would seem to be its natural effect, the acquisitions of stock above described, without our approval, appear to have constituted violations of section 7 of the Clayton anti-trust act and perhaps also of the Sherman act, unless section 5 of the interstate commerce act, as amended by the transportation act, 1920, by implication allows such acquisitions in advance of the granting of authority to acquire control.

Counsel for the applicants argue that paragraph 2 of section 5 of the interstate commerce act, in providing for the acquisition of control of one carrier by another through the purchase of stock, taken in connection with paragraph 8, which relieves carriers affected by our orders under that section from the operation of the "anti-trust laws," impliedly authorizes the purchase of a certain amount of stock—any amount less than a majority, apparently—of even a competing carrier, provided there is a *bona fide* intention to ask for our authority to acquire control, and an application therefor is filed within a reasonable time after the purchase. This, it is urged, is the proper course to pursue, and must have been contemplated by the framers of the law, because ordinarily it would be impossible to purchase the majority of the stock of a carrier at any reasonable price after obtaining authority for such purchase through a public channel, thus giving notice that the stock was to be bought.

Legal authorities are cited for the proposition that there can be no violation of the Clayton act unless and until there is actually brought about through stock ownership a diminution or lessening of competition in a substantial degree.

We are not convinced that paragraph 2 of section 5 permits acquisition of stock of a competing carrier to such an extent in advance of our authorization of the acquisition of control, and we entertain serious doubt regarding the repeal of the Clayton act by an implication of this kind. This, however, is a question which we do not feel impelled to decide in this proceeding.

Effect on Minority Stockholders

The proposed plan of control affords no proper protection to the minority stockholders of the M-K-T and Cotton Belt.

If the applications are approved it will be in the power and to the interest of the K. C. S. to discriminate against the other two carriers. Interveners assert that the K. C. S. has already used its practical control over the other companies to their detriment and that it will doubtless damage them further and much more seriously if it is allowed by us to perfect its control and make it certain and permanent in the manner proposed. The danger to minority stockholders * * * is a very real danger, especially if the holdings of the minority stockholders are large as in this case. The K. C. S. having control of the M-K-T can divert traffic from that road to its own, as hereinbefore indicated. If it owns only a little over half of the outstanding voting stock of the M-K-T, it will be greatly to its advantage to draw business away from the latter at all junction points and in other territories where the roads compete. In like manner the M-K-T, if it obtains control of the Cotton Belt, can divert traffic from that road to its own and if it owns less than the entire capital stock of the Cotton Belt it will be to its advantage, and to the advantage of the K. C. S. to divert business from the Cotton Belt. It is also within the power of a controlling company to injure a controlled carrier by permitting deterioration of its property or service. By these methods the price of the stock of the controlled carrier can be depressed and its acquisition by the controlling carrier or its stockholders facilitated.

Testimony on behalf of the applicants indicates that their plans contemplate taking care of the minority stockholders of the M-K-T and Cotton Belt through the eventual acquisition, by purchase or otherwise, of all of the stock of those companies upon equitable terms; that, if these applications are approved by us, a financial plan will be prepared for more effectually cementing the union of the three carriers, under which all the shareholders of the controlled companies will have the same opportunity to realize the value of their shares.

We are not impressed by the reasons given for failure to prepare and announce a plan for the protection of minority stock interests. Before we can approve an acquisition of control under paragraph 2 of section 5 we must know what the prospective provisions are.

Commissioner Taylor, in a separate concurring opinion, severely criticized the applications, saying that "not only have the applicants signally failed to show that the public interest will be protected in these important particulars, but the record is full of conclusive evidence which negatives the possibility of the accomplishment of any such beneficent results." He asserted that the Kansas City Southern had already by corporate action, "in defiance of law" secured control of the other lines. He also objected on the ground that the plan would eliminate competition.

Dissenting Opinions

Commissioner Meyer declared that the valid objections to the proposed unification are not sufficiently strong to warrant striking the plan down in its entirety and that an opportunity might well be afforded, through supplemental proceedings if necessary, to overcome objections which have been made and are thought to be serious and substantial.

Were consolidation, as contemplated in the law, possible at this time many if not all of the objections which have been raised against this unification might never have arisen. In other words, some of the objections which are thought to justify disapproval of the plan find their origin in our inability practically to give full effect to the consolidation provisions of the law. If the applicants could come here with a plan for consolidation of these three systems as contemplated in the transportation act substantially different questions might be presented. The report of the majority, in my judgment, presents a justification for the proposed unification from the standpoint of transportation * * * By rejecting applicants' plan in its entirety we waste all the effort that has been expended in an attempt to give effect to the law and somebody will have to begin all over again before the purpose of the law can be achieved in the Southwest * * * Of course, as pointed out by the majority, the relation of controlling securities to the aggregate assets controlled should not be allowed to become disproportionate. In that respect these applications are properly subject to criticism * * * The negative results produced by the report must therefore be ascribed principally to the financial objections to the plan. If so, these have not been adequately defined nor have attempts been made to secure their rectification.

Commissioner Hall authorized the statement that he was in general accord with the views of Commissioner Meyer.

Commissioner Lewis objected to letting the matters of public concern placed in the hands of the commission by these applications get out of its immediate control and he dwelt specially on the opportunity afforded to deal with the situation of some 60 short lines, operating 5,438 miles, in the territory involved. He said that in the Southwestern Gulf region all the larger independent lines except the three involved in this plan have already been taken into other system groupings and that "the situation that has been brought about by skimming off the cream and leaving milk certainly demands careful consideration. * * *

There are defects in the proposals now before us but, particularly when the applicants indicate willingness to consider objections which may develop in our considerations, their existence does not justify dismissal of these applications.

Woodlock's Opinion

Commissioner Woodlock concurred in most of the reasons stated by Commissioner Meyer, and he declared that the majority in failing to do its full duty in the cases has failed in fairness to the applicants. He also said:

Granted that we could not approve the applications as they stood, the applicants are fairly entitled to know our judgment on the really important question. This is whether or not the proposed grouping is apt for the purposes of eventual consolidation, and one which, under appropriate provision for unified operation in the meantime could be found by us to be in the public interest. It is all very well that courts of law should exercise due economy in the decision of cases that come before them, and that they should decide no more of the issues than are necessary for disposition of the case. We are not a court of law; in some respects we are a good deal less and in others a good deal more. We should have rendered judgment on the proposed grouping from the point of view of ultimate consolidation. I agree with Commissioner Meyer that this judgment should have been in the affirmative. I think it is our plain duty even now to reopen the case, both for that purpose and for the purpose of enabling applicants to substitute for the financial arrangements, which we have been unable to accept, others which we can accept, and to complete the record as to the inclusion of weak lines.

Electric Locomotives with Auxiliary Battery

THE Chicago, North Shore & Milwaukee is obtaining two 65-ton electric locomotives which can be operated either from a trolley or from the storage batteries on the locomotive. While operating from the trolley, the batteries can be charged through a motor generator set. The flexibility of operation of the locomotives, the first of their type, will enable them to switch cars into industrial plants equipped with tracks but not trolley connections. The absence of smoke, noise and noxious gases will permit the locomotives to run into buildings where a steam locomotive would be objectionable.

The equipment of each locomotive includes four 200-horsepower motors and a storage battery of 192 cells capable of delivering 260 kilowatt-hours on one charge. Operating on the battery, the locomotive can haul 33 loaded freight cars $5\frac{1}{4}$ miles at 12 miles an hour on one charge, or run light at a maximum speed of 37 miles per hour. The locomotives are being built by the General Electric Company, and will be equipped with storage batteries furnished by the Electric Storage Battery Company.



The Yazoo & Mississippi Valley Tracks Were Raised Several Feet at Baton Rouge, La.—Left: Track Gang Working Under Pressure; Right: Embankment Fenced to Prevent Wave Wash.

Breaks in Levees Inundate Railways in South-Central Louisiana

Main lines west of New Orleans endangered as flood sweeps down the Atchafalaya basin to the gulf

WITH the railways in all other affected sections recovering rapidly, the lines in the Atchafalaya basin in south-central Louisiana, are suffering heavily from the rushing water let loose when the levees on the Bayou des Glaives and the Atchafalaya river broke.

When the levee broke at Melville, La., on the Atchafalaya river, it carried with it a breakwater 125 ft. long built by the Texas & Pacific to protect the foundations of its bridge at that point. This breakwater was composed of 35 ft. lengths of piling chained together. At the same time, one span of the 1,500 ft. steel bridge at that point was washed into the river. This, together with the fact that the tracks are now covered with water as far west as Palmetto, severed the main line of the T. & P. into New Orleans, which was also used by the Missouri Pacific as their entry into New Orleans.

As a result of high water in the vicinity of the crossing of the Atchafalaya river and near Port Barre; the Gulf Coast Lines were also forced to suspend service on their main line into New Orleans. A levee break at Henderson caused additional inundation of the Southern Pacific branch line between Lafayette and Baton Rouge, on which service has been suspended for some time. Several T. & P. and G. C. L. branch lines are also under water and out of service. This leaves the Southern Pacific main line the only one in service from New Orleans to the west.

When it seemed inevitable that the levees in this section would break, arrangements were made for detour-

ing over the Southern Pacific, so that there would be no break in the service, except to such local points as were under water. As soon as the Gulf Coast Lines tracks were rendered unusable, because of high water, Gulf Coast Lines trains began operating on regular schedule by detouring over the Southern Pacific between New Orleans and Opelousas, La. All through trains will be operated over this route. In addition, motor cars will be operated between Baton Rouge and the Atchafalaya river. The only portion of the line which will not be served is a few miles between the Atchafalaya river and Port Barre. The Southern Pacific route used by the Gulf Coast Lines is also being used by the Texas & Pacific and the Missouri Pacific for all trains out of New Orleans. Because of the condition of the bridge at Melville, Texas & Pacific and Missouri Pacific trains had been detoured via the Gulf Coast Lines for some days before it became impossible to use this route.

Only One Line Open

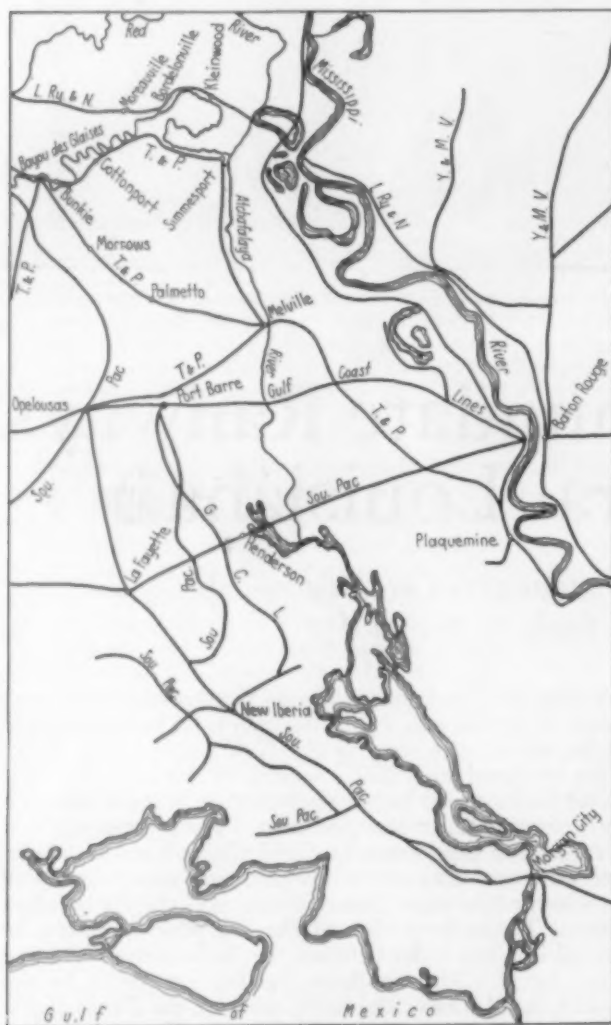
Of the five lines running west from New Orleans, four have been flooded to such an extent as to stop service. These include the Missouri Pacific, the Texas & Pacific, the Gulf Coast Lines and the Louisiana Ry. & Navigation Co. The latter line has many miles of track under water in the vicinity of the Bayou des Glaives, which it parallels for some miles. This leaves the Southern Pacific the only main line open to the west and every effort is being made to keep it going.

The ultimate fate of this line will depend very largely

on the stage of the crest when it reaches Morgan City. The vast flood unleashed by the Bayou des Glaisses and Atchafalaya breaks must pass through Grand Lake before reaching the line, so that no trouble is expected for at least ten days. Maintenance of service west of Morgan City will depend very largely upon whether the flood is of sufficient height to surmount the Bayou Teche ridge along the south side of which the railroad runs from Berwick to New Iberia.

The T. & P. Situation

The Texas & Pacific operates in four directions out of Melville, where the most serious break in the Atcha-



South-Central Louisiana—the Present Flood Center

falaya system of levees occurred. This break is now over 2,000 ft. wide and it deluged the northern half of the town of Melville almost as soon as it occurred. The high embankment of the T. & P. protected the southern half of the town for some time, but, in a few hours, the current washed out the embankment in many places and tore through to inundate the rest of the town. At last reports, the T. & P. main line was under water from Melville nearly to Bunkie. The Simmesport branch, running directly along the river, was entirely flooded and the branch to Opelousas was flooded as far west as Port Barre. No inspection was possible of the branch between Simmesport and Bunkie, but since it is immediately in the path of the water flowing through the

breaks at Cottonport, Moreauville, Bordelonville and Kleinwood, it is safe to assume that it is many feet under water.

The main line east of Melville has not been flooded as yet. The levees on the east side of the Atchafalaya are holding, but they are reported to be weak by inspecting engineers and thousands of men are attempting to save them. The engineers report that, at one point on the east bank, just north of Melville, some 600 yards of the levee has caved in. Nothing remains of the dike at this point but a tottering wall of sand bags. More than one million sand bags were placed in the crevasse in a few days by 2,000 men who are still working feverishly to prevent inundation. Should the levee break anywhere along the east bank of the Atchafalaya, it would inundate the fertile section of Louisiana between the Atchafalaya and Mississippi rivers, which is traversed by main lines and branches of the Texas & Pacific, the main line of the Gulf Coast Lines and a branch of the Southern Pacific, and add many more square miles to the flood lake, which is already 150 miles long and 50 miles wide in this section of Louisiana.

The Southern Pacific sent two special trains carrying more than 150 stock cars from Houston to the affected area to remove marooned cattle to the highlands. The cars were delivered at Lafayette and will be used to help remove some 5,000 head of cattle from St. Martin parish to a point of safety on the high ground between Crowley, La., and Welsh. Six thousand head of cattle that are being gathered on the Baton Rouge branch of the Southern Pacific will also be removed.

Northern Louisiana Relieved

The breaks in the Bayou des Glaisses levees have relieved the situation in northern Louisiana materially, since they provide an additional large outlet through which the flood may be drained. As in other cases, railway section forces are following the receding water step by step and rehabilitating the track. In this section, where there has been no swift current, it is possible to run trains over recently flooded track within a very short time after the water leaves it.

The line of the Missouri Pacific from Alexandria, La., through McGhee, Ark., to Pine Bluff and Little Rock is now being operated practically on a normal basis. Service is still sporadic on the branches that run close to the river, but regular service will be resumed there as soon as possible. Service is still interrupted between Vicksburg, Miss., and Monroe, La., on the Vicksburg, Shreveport & Pacific. Normal service is being maintained between Monroe, La., and Shreveport. In the flooded area, daily mixed train service is being operated between Delhi, La., and Quebec.

Arkansas Lines Rehabilitating

On all but a few isolated branch lines, of no considerable mileage, service on all the Arkansas lines has returned to normal. There is still much rebuilding and rehabilitation to be done, however, and it is estimated that the railroads in Arkansas will have spent between \$5,000,000 and \$7,500,000 in repairing flood damage before the books are closed. The three principal railroads involved are the Missouri Pacific, the Chicago, Rock Island & Pacific and the St. Louis Southwestern, the Missouri Pacific being the heaviest loser of the three. These lines, whose co-operation and hard work kept main traffic routes through Arkansas open throughout the flood, and which returned to normal service almost as soon as the water left their tracks, are planning complete and speedy rehabilitation.

The Missouri Pacific's heaviest damage in Arkansas,

based on the cost of restoration, occurred at Little Rock. This included the loss of the Baring Cross bridge and some track damage. Since April 15, 15 work trains have been operating daily in the vicinity of Little Rock, at a cost of \$2,500 a day, and 1,000 extra workers have been in service for a similar period, at a cost of about \$3,500 a day. The necessity for detouring all trains over the Valley Division bridge, because of the loss of the Baring Cross bridge, is costing additional thousands,

the work will hardly be completed in less than six months. The Missouri Pacific has spent approximately \$10,000 a day in fighting the flood and putting its tracks in condition to handle traffic. The rehabilitation program calls for rebuilding much of the roadbed in the Fourche bottoms, along White river, on the main line between Kensett and Bald Knob, in the Black river bottoms and along the Ouachita river near Arkadelphia. The main line tracks will be elevated to a height which



Flood Scenes Along the Missouri Pacific Between Alexandria, La., and McGehee, Ark.—Upper Left: Just North of Alexandria, Texas & Pacific Tracks Indicated by Stakes; Upper Right: A Meeting Point Near Columbia, La.; Lower Left: The First Passenger Train Since the Overflow, Near Fondale, La.; Lower Right: Views from Rear of Train Near Columbia, La.

which extra cost will be reduced when the double track now being built from the station to the bridge is completed. A wye is also being built at the bridge to facilitate operations. This work should be completed by June 15.

Announced plans of the railroad call for the restoration of the Baring Cross bridge as soon as possible, but

should eliminate all possibility of inundation in the future and to protect the high fills from water pressure, unusually large passages through the fills will be built to provide greater outlets for the water. All wooden bridges are to be replaced with concrete and the present concrete structures lengthened and strengthened.

The damage done the Cotton Belt was largely through

washouts. Long stretches of its embankment have been or will have to be replaced in their entirety. This line has been working a large force of extra men during the flood and will continue to employ an extra force of 1,000 or more for the next 30 days, repairing tracks, rebuilding wash-out fills and replacing ballast.

This railroad's embankment was badly damaged between Pine Bluff, Ark., and Humphrey, with the greatest damage in the vicinity of Clarendon. Its tracks were also badly washed out in the valley of the St. Francis river in Arkansas and in the Red river valley near Garland City, La., and Shreveport. The Little Rock branch was damaged for several miles between

is being operated between Coahoma, Miss., and Benoit, on the Riverside District. All other trains on this district are discontinued. A limited train service is being operated on the Kimball Lake district, between Rosedale and Dockery, while mixed trains are being operated between Cleveland and Helm, connecting with trains operated to and from Cleveland.

Ferry service is still inoperative between Helena, Ark., and Trotter's Point, Miss., on the Helena branch. A train is being operated each way daily between Jonestown, Miss., and Jefferies.

Service is still interrupted between Silver City, Miss., and Yazoo City, on the Sunflower district, and between



The Yazoo & Mississippi Valley Right of Way at Egremont, Miss., Was a Haven of Refuge

Alzheimer and England and there were washouts on the Pine Bluff and Arkansas river branch between Rob Roy and Reyndell, on the Blytheville branch between Paragould and Blytheville; and Bird's Point and on the New Madrid branch between Lilbourn, Mo., and New Madrid.

The Chicago, Rock Island & Pacific plans to spend nearly \$300,000 in the next few months restoring ties, rails, fills and ballast between Booneville, Hot Springs, Hulbert and Little Rock.

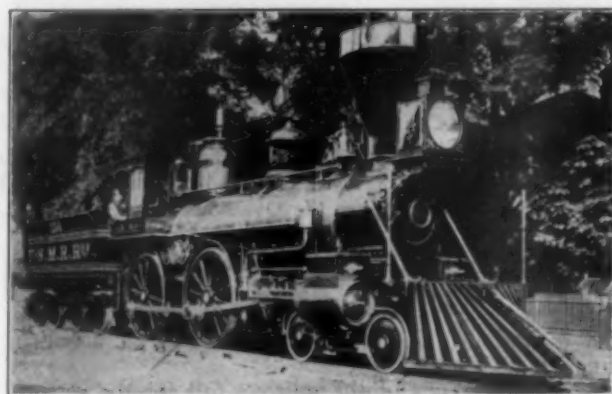
East Bank Much Relieved

With much of the water that would ordinarily flow down the Mississippi river now racing through the Atchafalaya basin to the gulf, the situation in Louisiana on the east bank, including New Orleans, is very much relieved. It would appear that the magnificent battle the Illinois Central has been waging against the river at Baton Rouge and on the levees between Baton Rouge and New Orleans has been won. Weak spots continue to develop in the levee system, however, the latest one at Belle Hellene, but the levee forces, consisting principally of I. C. maintenance men, have prevented any breaks. With the relief afforded by the breaks in the Bayou des Glaives levee system, however, the danger of breaking levees on the east bank is materially reduced.

The overflow is slowing leaving western Mississippi and service on the Yazoo & Mississippi Valley is improving daily. On the main line of the Y. & M. V. between Memphis and New Orleans service is still interrupted between Vicksburg, Miss., and Helm. From Vicksburg south, regular schedules are being maintained. In the affected area one train each way daily

Silver City and Kelso. Trains are being operated, however, between Clarksdale and Silver City and between Silver City and Tutwiler.

THE SECRETARY OF COMMERCE, Herbert C. Hoover, has agreed to act as head of the committee which is to select the winners in the American Railway Association contest among school and college students for the best essays on the subject of how to prevent grade-crossing accidents. The other members are Thomas P. Henry, president of the American Automobile Association, and Walter G. King, president of the National Safety Council. Three cash prizes of \$250 each will be awarded, one for the best essay by a grammar school student, another for the best essay by a high school student and another for the best essay by a college student.



Used by the Union Army in the Civil War

Consideration of Board in Western Wage Case Extended to June 26

Employees' rebuttal indicates an increase in freight rates would not be a burden to farmers

THE time within which the board of arbitration must give its decision in the hearing on the application of the Order of Railway Conductors and the Brotherhood of Railroad Trainmen on western carriers for increases in pay of \$1 per day, which started on April 27 at Chicago and closed on May 24, was extended to June 26 upon consent of both sides. In the agreement to arbitrate it was specified that the board should make and file its award within 30 days after the beginning of the hearings. The carriers rested their case on May 18 and were followed by the rebuttal testimony of the employees, which ended on May 20.

L. E. Sheppard, president of the Order of Railway Conductors, opened the oral argument for the employees on May 23, and after 4 hours was succeeded by H. A. Scandett, vice-president of the Union Pacific, for the carriers. By mutual agreement it was decided that oral arguments be confined to five hours for each side, the employees opening and closing.

Employees Present Rebuttal Testimony

A. C. Murphy, a conductor on the First division of the Oregon-Washington Railroad & Navigation Co., said that the time required to copy a set of reports of one trip made out by a local conductor running between Starbuck, Wash., and Umatilla, Ore., on the Third division of this road was 3 hours and 19 minutes. F. H. Nemitz, at one time general chairman of the Order of Railway Conductors on the Southern Pacific, presented an exhibit showing the daily rates of passenger and freight conductors and said that a 7½ per cent increase would be necessary to bring the rates of the Atchison, Topeka & Santa Fe, the Chicago, Rock Island & Pacific, and the Missouri Pacific up to the daily rates paid in the east and south.

On cross examination he said that in the western territory there are some through and local rates that are higher than the so-called standard basic rates of the east and the south, but that, at present, the 7½ per cent increase in the east makes the guaranteed basis in the east \$8 per month more than on some of the western lines, while if a 7½ per cent increase were awarded the western lines the guaranteed basis on the western lines would be \$7 more per month than on the eastern lines.

G. W. Hunt, an earlier witness for the employees, was recalled and presented an exhibit showing the increased productivity of the trainmen. He stated that the gross ton miles handled in this district between 1923 and 1926 increased 40,000,000 or 10.91 per cent, while the earnings of the conductors and brakemen decreased \$3,088,772, or 4 per cent. In 1923, each employee handled 12,791,846 gross ton miles and in 1926, 13,274,897, or an increase of 18.84 per cent, while the gross ton miles handled per employee in the Eastern district in 1926 were 12,172,000 and in the Southern district 12,271,000.

He expressed in money the increased productivity of the conductors and brakemen in freight service between 1923 and 1925 on the 34 roads included in his tabulation. The average revenue for these roads was \$0.01225 per ton mile and the average revenue ton miles increased

679,710 per employee, which he stated amounted to an increased productivity per employee of \$8,326.45 per year.

The total revenue per employee in 1926 in the Eastern district as \$57,285, in the southwestern \$49,100 and in the western \$58,713. In 1923, 4,738 gross ton miles were moved per freight wage dollar in the west, as compared with 5,332 in 1926. He said there was an increase of approximately \$68,000,000, or four per cent in revenue between 1925 and 1926, with an additional cost to the railroads in freight conductors' and brakemen's wages of \$925,000, or 1.25 per cent.

If a 20 per cent increase in wages were granted this class of employees and there was no further increase in productivity, it would add 10 cents to a ton of freight handled 1,000 miles or approximately 12.5 cents to 100 lb. of freight carried 35,000 miles. In 1921, an employee received 60 cents for moving a ton of freight 1,000 miles, and in 1925, 50 cents. Of 37 western roads 10 paid their through freight brakemen less than \$150 per month, he said, while five went as low as \$130 per month and two as low as \$92 per month.

Employees Show Cost of Living

W. A. Bruce, a clerk in charge of the employment department of the Brotherhood of Railroad Trainmen, introduced an exhibit showing the cost of living of 11 employees in Chicago. The expenses ranged from \$170 to \$249 per month, the lowest being that of a man with a family of six, while the highest as that of an unmarried man. The former's rent as \$27, while the latter lived at home and paid \$60 a month for room and board, while his away-from-home expenses were \$28, and his other expenses \$150. W. P. Kennedy, general chairman of the Brotherhood of Railroad Trainmen of the Chicago, Milwaukee & St. Paul, submitted an affidavit of a passenger brakeman on this road who earned \$145 and expended \$189.

Wm. Bishop, general chairman of the Brotherhood of Railroad Trainmen of the Northern Pacific, presented affidavits of several employees showing their expenses. A yardman on this road furnished an expense account for three months of 1927 for a family of 10, the children ranging from 1 to 16 years in age, which showed that in January, February and March of this year he earned \$162, \$151 and \$175, while his expenses were \$208, \$192 and \$206 respectively.

Mr. Bishop also presented a comparative statement of receipts and expenditures furnished by a yard employee on the Northern Pacific at Fargo, N. D., which showed that in 1920 he worked 342 days, earned \$2,401 and spent \$2,356, while in 1926 he worked 365 days, earned \$2,365 and spent \$2,349.

Increased Freight Rates No Burden to Farmers

A. F. Whitney, vice-president of the Brotherhood of Railroad Trainmen, testified that the farmer has progressed more rapidly than the railroad man, or any other man who works for a daily or monthly wage:

"Throughout their entire testimony," he said, "witnesses for the western railways, in opposing an advance in wages, have contended that railway earnings are not sufficient to stand higher wages without increasing freight rates or impairing service, and have stated that their rates have been materially reduced in the last few years because of the agricultural situation.

"If an increase in freight rates were necessary to enable the railroads to absorb any increase in wages, that would not be any real burden to the farmer. Further, a lowering of wage levels on the railroads or in industrial occupations or a lessening of the total of the pending wage request for trainmen and yardmen would not benefit the farmers of the United States in any manner.

"During the past 25 years, I have noticed a wonderful improvement in farming conditions. The farmer has kept pace with the progress of the times. According to an investigation I have recently made, approximately 97 per cent of the Nebraska farmers own automobiles and 89 per cent own telephones, and what is true in this respect in Nebraska is very largely true in Iowa, Minnesota and other granger states. The farmers today have comfortable and, in most instances, modern homes. Their homes are equipped with bathrooms, electric lights and other modern conveniences, very largely to the same extent as the better classes in the cities.

"It is a matter of common knowledge that hundreds of farmers are retiring annually and moving to the towns and cities to live in comfort and ease. The Squire Realty Company of Aberdeen, South Dakota, wired me on May 9 that there are from two to three hundred retired farmers living in Aberdeen, a city of about ten thousand inhabitants. Aberdeen is also a railroad town, being a terminal for the Milwaukee and for a branch of the Great Northern, but I do not know of any railroad brakemen or yardmen who have been able to retire in that city.

"The Chamber of Commerce of Long Beach, California, advised me on May 14 that it estimates between five and ten thousand retired farmers living in that city. There are no retired railroad brakemen or switchmen living in Long Beach that I know of. There are many retired farmers living in Los Angeles. As a matter of fact, there are so many Iowa people residing in that city that they have organized an Iowa society, and it is my understanding that they hold picnics there annually. That indicates that the Iowa farmer is prosperous, otherwise he could not retire and go to Long Beach or Los Angeles to live."

Mr. Whitney also testified that he had made a study of the declaration of courts, commissions, arbitration boards and other bodies of similar character, which showed that the theory that the increases requested should not be granted because of the alleged inability of the carriers to pay is not sound or fundamental. In support he submitted citations to prove that the pleas of the railroads to set aside or disregard the demands of the employees on the grounds of their financial inability to meet increases in pay because of their financial status were disregarded in the decisions rendered by many tribunals.

Employees Argue Their Case

L. E. Sheppard, president of the Order of Railway Conductors, opened the oral argument for the employees. He said in part:

"It is the contention of the employees that the basic rate is the only sound and sensible basis of compensation and that neither averages, total annual compensation, overtime, special allowances nor any other basis than the basic rate is proper in fixing wages or in the consideration of wage increases. Averages will not do, because men cannot live on the low rates and the high rates are usually not excessive nor are they paid to any considerable number of the men. An average speaks nothing insofar as the individual is concerned. Overtime added to the basic rate is unscientific and unsound as a measure of compensation when they are considered together, because the men would have to work overtime in order to earn a living and there would be no incentive to eliminate the overtime. Special allowances are of such a nature, generally speaking, that they cannot be considered in connection with fixing a basic rate as they accrue only to a special few, and then only under unusual conditions.

"The claim of the carriers that our men are making high rates per hour for the time actually on duty is one of the most unsound and unscientific claims that could be set up in an effort to defeat the fixing of proper basic rates, especially when it is viewed from the standpoint of the number of hours

that railroad men must spend either on duty or away from home and when consideration is given to the fact that no allowances are made to these men while away from home except that which accrues as a result of the held-away-from-terminal rule. This rule is applicable only to men in pool freight and in unassigned service.

"There is no question but that the duties, responsibilities and hazards of trainmen are augmented in proportion as the length of trains and tonnage handled are increased. A man riding the caboose behind a long train is on a constant tension while the train is in motion in keeping himself braced in order to guard against serious injury or perhaps death if the train should come to a sudden stop. It is not uncommon for such sudden stops to occur. We are advised that the shock on the rear of long trains is so terrific that, when stock is shipped in such trains, it is carried on the head end in order to avoid damage claims resulting from injury to the animals in transit. The average increase in tonnage or output shown by our witnesses is approximately 35 per cent. This compares with the 5 or 6 per cent increase in wages to our men since 1923.

"If there has not been increased efficiency on the part of our men, how could this wonderful output that has been shown by the testimony of our witnesses and fortified by the reports of the Interstate Commerce Commission have been accomplished?

"Formerly a brakeman could reasonably expect to be promoted to a freight conductor and eventually become a passenger conductor, but men entering the service nowadays have, in most instances, no assurance that they will ever be promoted and if promoted they do not know that they will be able to hold a position of freight conductor regularly. It is a remote possibility that many of them ever will become passenger conductors. When trainmen are laid off on account of slack business it is difficult for them to secure positions elsewhere in other lines of endeavor and almost impossible for them to secure positions on other railroads in their own occupations.

"A great deal of testimony has been given by railway executives and others to the effect that passenger service is not a profitable investment for the railroads, and it has also been pointed out by at least one of our witnesses, in whose testimony we fully concur, that passenger service is very largely a form of advertising for the railroads. If such is correct, as we believe it is, any losses or lack of return should be placed in the proper classification, as an advertisement. We think that there is just ground for the claim that a great amount of the passenger equipment in the western territory is merely an advertising or rivalry contest among railroads. We have heard the poverty plea of certain railroads, some of whom are in receivership; yet at the same time there is the greatest rivalry among these and other lines as to who can make the greatest display in their passenger equipment."

Mr. Scandrett opened the oral argument for the carriers on May 23. He said in part:

"The productivity argument, as it has been advanced here, shows that the load per car, the number of cars per train and the gross tons and net tons per train mile have increased substantially, and that, therefore, the trainmen have increased their productivity and are entitled to an increase in pay on that account. It is first to be noted with reference to this argument that it applies, or would apply, only to the freight conductors and the freight brakemen. It leaves out the passenger conductors and the passenger brakemen, because by this test there has been a decrease in productivity so far as those men are concerned, because both the number of passengers per mile and per train mile and the aggregate passenger earnings as well, have all declined substantially in this period, which is the period 1923 to 1926, as has been developed by the witnesses for the men.

"The speed with which the train gets over the line may be affected by the action of the trainmen, but possibly more by the action of the enginemen, save in the case of the local way freight, where the expedition with which the men do their station work or their switching work does affect the result. But even the matter of the increased speed depends on the size and condition of the locomotive, the condition of the cars and the roadbed and the other facilities which are affected by the work of other railroad employees, but not at all by either the trainmen or the enginemen.

"Increased productivity has been made possible by two things. First, by the fact of a very large expenditure of money, new cars and larger cars and stronger cars have been purchased by the railroads, and it is due also to the fact that in this very trying period we have had a very great measure of co-operation with the shippers on these lines, and that co-operation has been reflected by an increase in the tons which have been loaded into these cars. Very obviously the trainmen could not effect this result.

"Increased cars per train and increased tons per train mile may well be considered together. They have their origin in

the same causes. The principal cause is, of course, the increase in the pulling power of the locomotive. This has been brought about by the substitution of new and heavier locomotives, and that has involved again a tremendous expense on the part of the western lines.

"The result has been that the trainmen, whose basic day is eight hours or less, or a hundred miles or less, has been able to earn the same money in shorter hours or to earn more money in the same hours. To the extent, therefore, that they have contributed to the increase in speed of trains, which consideration necessarily has been limited largely, if not entirely, to the saving in time in the handling of station work and such matters, they have been compensated by shorter hours or more money for the same hours.

"Now, what has been the effect on their duties? The record shows that that has been negligible, insofar as any increased work or responsibility is concerned. The reports are not different than they were when there were shorter trains. The number of break-in-tuos has decreased, the number of hot boxes has very substantially decreased; and consequently this increase in the length of the trains, and in the train loads has not been accompanied by a proportionate or any increase in the amount of work that these trainmen are required to do. If there has been an increased productivity attributable to the men in freight service, there has just as surely been a decrease so far as the passenger business is concerned. The number of passengers per train has dropped almost 40 per cent., but nobody would claim that the passenger conductor or the passenger brakemen were in any wise responsible for that result.

"A study made by the United States Bureau of Labor Statistics covering the cost of living of 12,096 families residing in 92 industrial centers throughout the United States shows that 1,594 families in the group earning between \$1,800 and \$2,100 had an average of 5.1 persons to the family and each family averaged a surplus of \$169 at the end of the year. This group which had an average income of \$1,950, had an income which was \$363 less than the average compensation of these men before the Board here. And notwithstanding the fact that they had \$363 less than these men, they saved, on an average, \$169.

"It is our position, first, that the present scales of wages are adequate. Second, that the present wages are more than fair as compared with wages in other industries, and with wages of other employees. Third, they provide greater purchasing power than the peak scale of 1920. Fourth, in contrast with the situation of their employees, the western railroads have earned a much lower return than in pre-war years, resulting in a greatly reduced purchasing power as compared with the pre-war period. Fifth, that the western railroads have been forced to reduce freight rates by economic conditions in the territory they serve and particularly because of the depressed conditions of agriculture and live stock industries. Sixth, these conditions have not existed in the east and the south to the same extent, and, as a consequence, freight rate reductions in these territories have been smaller than in the west. Seventh, that western railroads have suffered severe reductions in passenger revenues, while eastern and southern lines have enjoyed substantial increases, and eighth, the result has been lower returns on the western lines and higher on the eastern and southern railroads.

"Aside from the increase which the men received in 1924, they are better off than most, if not all, of the other employees of the railroads, because many of these other employees' wages were reduced by the Labor Board subsequent to 1921, and any readjustments upwards which have since been made by the managements have not brought them up to the level of the wages of the trainmen stated in percentage, in both cases, of the peak scale of 1920. In 1920, the employees received 48.10 per cent. of the gross operating revenues, and that had been reduced in 1925 to 38.13, and by way of contrast in 1920 the train employees received 14.37 per cent. of the compensation paid other employees and that percentage in 1925 had been increased to 17.22.

"It is to be noted that a very large majority of the men involved in this arbitration live in cities of 30,000 and less, and that the costs of living in the smaller cities are substantially lower than in the larger cities. It appears that in the matter of real wages these men are in substantially better position than they were during the period when the peak scale was in effect. The reduction, and a substantial reduction in the cost of living, has automatically given to them an increased purchasing power.

"Considering the increase in the investment on the western lines, there are now fewer dollars of net revenue than in the pre-war period and each of these dollars they now receive has, of course, a substantially lower purchasing power than the dollar they received in the pre-war period. So there is a very decided contrast as between the situation of the employers and the employees in this matter of purchasing power.

"The western railroads have been forced to reduce their freight rates by the economic conditions in this territory, and particularly because of the acute depression that has existed as to the agricul-

tural and live stock industry, and those conditions which have forced reductions in freight rates in the west have not operated to nearly as great an extent in the eastern and southern territories. If the western lines had been permitted to retain 41 per cent of the increase in rates, as the southern lines were permitted to do, they would have received \$76,000,000 more in 1926 than they did receive, and if their rates were 69.51 per cent higher than the 1915 level, which is the situation in the east, their net revenue in 1926 would have been increased by \$447,000,000."

Carriers File Brief

On May 23, the carriers filed a brief of 94 pages which included detailed information relative to the compensation of employees, the effect of previous wage orders and adjustments, the decline in the cost of living, the wages of workers in the building trades, the relation of railroad wages to transportation, the hazard of employment, productivity, and basic rates of pay.

The brief stated that the present demand of the train and yard service employees constitutes an effort to begin a whole new cycle of wage increases to railroad employees. The enginemen and firemen are already proceeding in the East and South, and numerous executives and operating officers have testified in this hearing as to the pending demands of other classes of employees, some of which are soon to be made the subject of arbitration. In these circumstances, the railways submit that the entire wage bill of the Western lines must be considered, in order to determine the ultimate effect of the wage increases here demanded, as well as the effect any decision may have upon the economic life of the territory.

It also argued that a wage increase of 7½ per cent to the conductors, trainmen and yardmen in the West would place the wages of these men above the peak rates of 1920-1921. Present rates of pay of these classes range from 93.65 per cent (in the case of switch tenders) to 95.97 per cent (in the case of local freight conductors) of the peak rates. Meanwhile, the great bulk of railroad employees, in fact all except those engaged in train and engine service, are, much further below the peak rates. Thus those engaged in the maintenance of way and equipment, departments, which cover the numerically largest classes of railway employees, range from 75.40 per cent to 89.23 per cent of the peak wages of 1920-1921.

The economic effect of an increase in the wages of these railroad employees, it continues, cannot be ignored. Based on the 1925 payroll an increase of 7½ per cent in their compensation would amount to \$12,262,085 per year, and a similar increase in the wages of all employees of the Western railroads would amount to \$83,155,292 per year. In the end the public must pay the bill for rising transportation costs. It is not a question of the so-called 'ability of the employer to pay' in the usual meaning of that phrase which confronts the Board in this proceeding. Rather, it is a question of the reasonableness of the present wages in relation to the economic condition of the West and its ability to meet the burden of increased transportation costs.

This is not a mere controversy between employees and employer. In securing freight rate reductions and preventing freight rate advances when they were sought by the carriers to provide a fair return on invested capital, the agricultural and live stock interests of the West have emphatically declared that the post-war depression of agriculture requires lower transportation costs. These railroad employees are a part of the transportation agencies which have been required to make their contribution to the relief of agriculture through reduced freight rates, resulting in an impairment of their earning power. As a part of the railroad industry of the West these

employees cannot persistently demand increases in their own wages up to or beyond the 1920 peak and at the same time ask the economic consequences of their demand be ignored.

K. F. Burgess Closes for Carriers

K. F. Burgess, general solicitor of the Chicago, Burlington & Quincy, presented the closing argument for the carriers on May 24. He said in part:

"A seven and one-half per cent increase to all employees would amount to \$6,000,000 and the Chicago, Burlington & Quincy in the face of that could not under present rates and present returns continue its dividend of 10 per cent. The record shows that if this railroad were capitalized as other railroads are it could not pay 5 per cent in those circumstances.

"But permit me to direct your attention to an analysis of the wage earning population of the west upon whom sooner or later any burden of increases in transportation cost must fall. There are approximately 12,000,000 people in the western district who are classified in the census as being gainfully employed. In the United States, as a whole, about one person out of every three is thus classified as being gainfully employed. Now in the western district out of that 12,000,000 people, 4,500,000 are engaged in agriculture, forestry and animal husbandry. This record shows that there has been a distinct downward trend since the peak of 1920 in the income of this agricultural population. Of these 12,000,000 people, 4,500,000 of whom are engaged in agriculture, they are receiving today distinctly less than they did in 1920. It was shown on this record that the present wages of these men in the building trades have been determined and based in arbitration awards upon the seasonal character of their employment that they averaged from 150 to 200 working days out of the year. It was shown by data compiled by public or semi-public authority that even during this so-called building boom there has continued a seasonal character of employment in the building trades. The only challenge which has been made to that statement upon this record was made by Mr. Whitney, who referred to efforts in St. Paul, Minn., to have building all the year round and to his own experience in building certain structures in Chicago during the winter months.

"The evidence of the railroad executives who testified has not been challenged in any substantial particular. In fact, such little attack as has been offered upon our proof was largely in the testimony of Mr. Whitney, who devoted himself first to this situation of the building trades; and second to the condition of agriculture which he said was different from the condition which he had depicted and which has been presented to the Interstate Commerce Commission and on which the Commission has made these findings to which I have referred."

W. N. Doak and L. E. Sheppard Close for Employees

W. N. Doak, acting president of the Brotherhood of Railroad Trainmen, followed by L. E. Sheppard of the Conductor's organization, presented the closing argument for the employees and thereby ended the hearing. Mr. Doak said in part:

"The argument or contention of the counsel of the carriers concluding that the employees should not be granted increases in pay until the standard return was realized, until all of the added improvements and betterments had gone into the properties and until everything else was adjusted is contrary in principle to all past precedents that have been presented. The human element, the laborer, is the first consideration and irrespective of what may be the other contributing causes to the

financial inability of these carriers to meet their requirements, it never has been held by anybody that labor was anything but the first consideration.

"These gentlemen have warned you in particular that they are fearful of a wage cycle that is going to take place. It has already taken place and is already in progress. In other territories the employees are away ahead of the process and still will be away ahead of the procession if the 7 per cent is granted, and even if the 19 per cent was granted they would still be ahead in the other territories. In other words, two-thirds of the men in this country will be ahead of the other third even if the 19 per cent were granted.

"The carriers have stressed the question of differentials. Differentials do not amount to anything. I do not know how they were established. They cannot tell you themselves.

"The question has been asked, and it has been argued here, as to why we did not handle this as a nation-wide proposition. We handled this wage movement in 1926 and 1927 just as we thought best and as the carriers thought best in territories instead of in a nation-wide movement. That point, therefore, should not be argued. We did not single out any particular section of the country to go after. It is true we made a settlement somewhere else but we could not handle three wage movements at one time." Mr. Sheppard said in part:

"It is admitted in the west that the passenger train income or the income from passenger trains has been depleted somewhat; but in the main it has been on the local or short turnaround passenger runs. Those of us who come out of the big terminals are impressed and must be impressed with the success of their long trains and the palatial trains that they are putting on; and when we stop to consider that between this city and St. Louis there has been a tremendous amount of money expended by the carriers in competing with one another, to get the few passengers who may ride there, we are led to believe that it is not a serious problem with them; but, as a matter of fact, it is good advertising.

"From my observations of the farmers during the war, especially in Iowa, I concluded that they tried to buy all of the land they could get their hands on and some of them did not unload and cannot unload without serious loss. I find, however, that the average farmer who owns his farm and who is content with being a farmer is getting along fairly well.

"The tenant farmer lives perhaps from hand to mouth now in any section of the country, just as they have always lived from hand to mouth. It is most difficult for them to compete with that which surrounds them. It is not due to freight rates or to anything of the kind, but just because they are only getting enough to live on and thereby cannot buy a farm or go in other business.

"I have heard a story regarding the attitude of the farmers and their condition. It may be a little far fetched, but when I step around and walk around the town in which I live on a Saturday afternoon or most any evening and when I want to park my automobile in front of my own building, I usually find some farmer's automobile there and he and his wife are generally in the picture show or around the corner talking to some neighbor. It was said that this conversation was overheard: One farmer said to the other: 'John, what are you doing in town with the Ford?' The reply was, 'My wife had the Cadillac and my daughter had the Buick so I had to use the Ford.' When I ride between here and Omaha and see some of these magnificent farms, and when I talk with farmers riding on the train I do not think the words 'poor farmer' should be used so much."



New Roller Bearing Equipped Train on C. M. & St. P.

New Pioneer Limited Equipment Is Placed in Service

Both railroad and Pullman cars for crack St. Paul train are of the latest type and fully roller bearing equipped

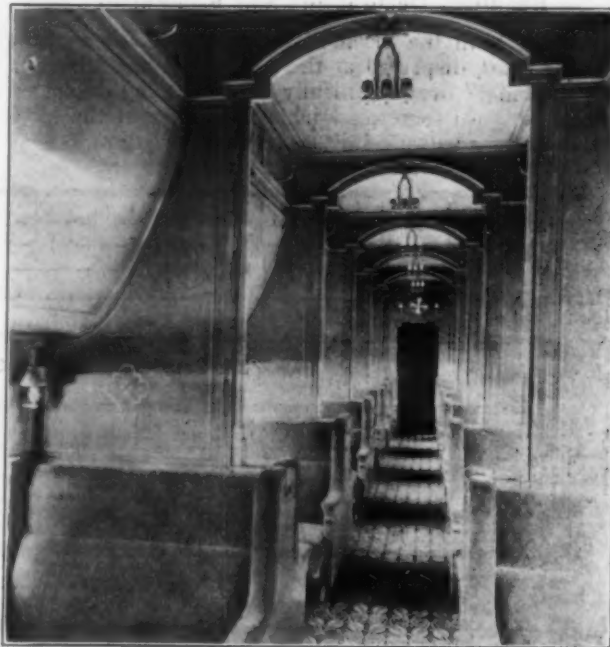
ON May 21, the Chicago, Milwaukee & St. Paul placed on opposite daily runs between Chicago and the Twin Cities, Minn., two newly-equipped Pioneer Limited trains, which are unexcelled in the beauty of their appointments or in the character of their facilities for the comfort of passengers. They have the added distinction of being the first through trains in regular service, all the cars of which, including the Pullman sleepers, are provided with roller bearings. New cars of the same type are also being received by the St. Paul for the four Olympian trains for the daily service each way between the Twin Cities and Puget Sound, and it is expected that transcontinental service with this new equipment will be inaugurated about August 1.

A total of 127 cars are involved in the new equipment for the St. Paul, which, as described in an article on page 835 of the *Railway Age* of October 30, 1926, consists of 64 completely rebuilt and modernized St. Paul cars equipped with Timken roller bearings, and 63 Pullman sleeping cars, built by the Pullman Car & Manufacturing Corporation, especially for service in these trains, with the Timken roller bearings, axles, wheels, pedestals and boxes owned by the railroad. All of the sleeping equipment in the new trains will be operated by the Pullman company and it is interesting to note, therefore, that on May 21, after an interval of 37 years, Pullman service in Pullman owned equipment was again installed on St. Paul trains. This service may later be extended to other than Pioneer Limited and Olympian trains.

Easier Train Handling Anticipated

Dynamometer car tests on the St. Paul have shown that roller bearings reduce the starting resistance of trains to about one-seventh of that encountered when

plain or friction bearings are used and this fact, coupled with the provision of modern specially-designed friction-draft gears and buffers of the Waugh type, is expected

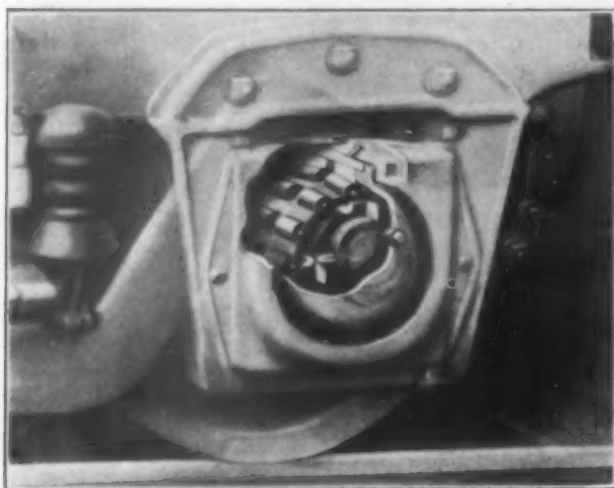


View Showing Simple and Artistic Lines of Sleeping Car Interior

to contribute to unusual ease of handling of the new trains, as well as economy in fuel and oil consumption and other attendant advantages.

Another feature tending to promote easy riding of the cars is the use of rubber cushions between truck center plates and truck bolsters, and in the equalizer spring caps. As a safety measure, car bodies and trucks are locked together.

One of the illustrations shows a phantom view of a Timken roller bearing applied to a St. Paul car journal. The dimensions of the individual bearings are as follows: The bore is 5 in.; outside diameter, 11 $\frac{5}{8}$ in.; and the width of the cone at its contact with the axle 6 $\frac{1}{4}$ in.; the latter dimension affording a considerable saving in overall length of the axle and bearing housings. The rated capacity of the bearings is 34,000 lb., radial, and



Phantom View of Timken Roller Bearing Applied to Pioneer Limited Car Journal

28,700 lb., thrust load, at 500 r.p.m., corresponding to about 55 miles per hour train speed.

Beautiful Decorations and Equipment

Starting with the locomotive, the exhibition Pioneer Limited train, displayed at the Union Station, Chicago, May 16 and 17, was beautifully furnished and decorated throughout. All exteriors, including those of the locomotive and tender, are finished in the St. Paul orange as

the predominant color, with dark maroon trimmings. The rods on the 210-ton, Pacific-type locomotive are polished, and the bell, whistle and cab fittings are nickel plated.

Next to the locomotive is a modern 72-ft. baggage car, followed by a 14-section sleeper, 12-section, one-drawing room, sleeper; library-club car; dining car; ten-section, one-compartment, one-drawing room, sleeper; three-drawing room, six-compartment, sleeper; and single room, observation car.

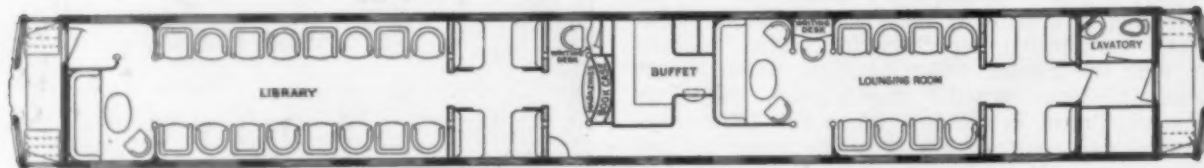
The sleeping cars, of all-steel construction including the interior finish, are notable for simplicity of design, completeness of facilities and artistic decorative effects. They are 83 ft. long and weigh 80 tons each, being carried on Commonwealth six-wheel cast-steel trucks with Gary rolled steel wheels and equipped with Simplex clasp brakes. The car insulation, heating and ventilating systems are designed to assure maximum comfort under varying climatic conditions and temperatures, individual heat control being provided in all rooms. The Vapor car heating system includes the use of 2-in. flexible metallic steam connections between the cars to afford unrestricted flow of superheated steam to the rear of long trains. A Barco 2-in. flexible metallic connection between engine and tender also provides a reliable and full-size passageway for the flow of steam. The ventilating system includes air intakes on the window sashes, electric circulating fans and electric exhaust fans, in addition to the exhaust ventilators of the Garland and Utility types.

Stationary outside sashes in the diner and parlor cars avoid drafts in winter and dust in summer, the cars thus being entirely dependent on forced ventilation for change of air. Brass window sashes and fixtures are provided by the Curtain Supply Company, Chicago. The use of a new type weatherstrip, consisting of a brass strip in the interlocked brass casing, avoids the necessity for applying storm sashes. Both Safety and Gould axle lighting equipment is installed on these cars, some of which are furnished with Edison batteries and others with Exide batteries.

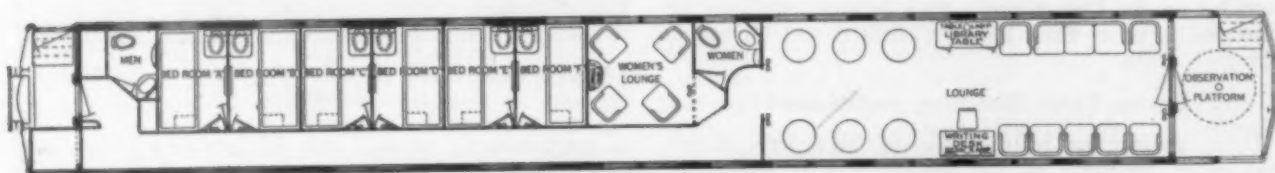
The interior of each sleeper is of Spanish design and coloring, with walls, ceilings, lighting fixtures, furnishings and all other details designed to produce harmony and beauty of architectural line and decorative effect.



Six-Compartment, 3-Drawing Room, Sleeping Car



Spacious Library Club Car



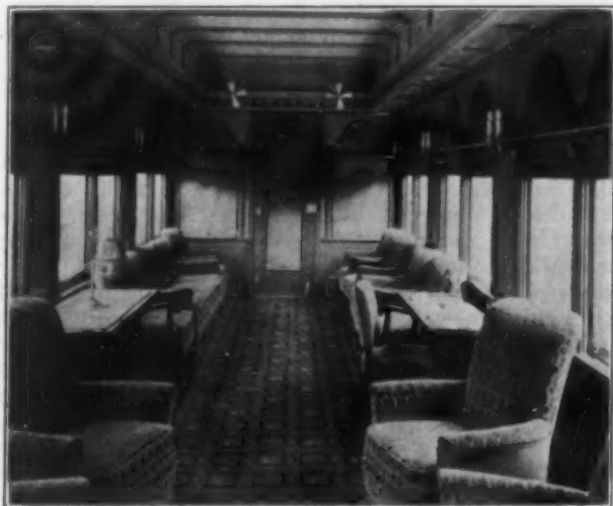
Single Bedroom—Women's Lounge—Observation Car

The general use of candelabra to the exclusion of ceiling dome lights wherever possible is an innovation which promotes the artistic and homelike atmosphere. The usual tunnel-like effect in the open sleeping cars is relieved by a series of arches of Spanish outline across the aisle and connecting the headboards. General illumination is afforded from bronze triple-lamp fixtures, one of which hangs in each of the archways, supplemented by bronze amber-shaded reading lights in each section. Generous lavatory facilities in both the men's and women's washrooms avoid crowding and waiting, especially on over-night journeys followed by early arrival at destination.

The library-club car is finished in mahogany with furnishings in harmony with the rest of the train; the carpet is a rich red with large floral design and chairs and sofas are upholstered in brown Spanish leather. Buffet service to both clubrooms is provided from a well-equipped buffet in the center of the car. In addition to numerous armchairs, two sofas and four sets of section seats for card players, each club room has a writing desk and movable oval table. The beamed ceiling of the library-club car is ivory tinted, lined in gold. The lighting system consists of snowball ceiling fixtures and side bracket lights of similar design. The use of tapestry panels in place of mirrors for decorative purposes is a new feature.

Diner Has Several New Features

The 72-ft. dining car has a capacity to seat 36 persons and is finished in light brown mahogany with beamed ceiling as in the library-club car. The straight-back chairs with spring cushion leather seats have cream colored slips with figured design, while the du Pont Fabricoid window shades, furnished by the O'Fallon



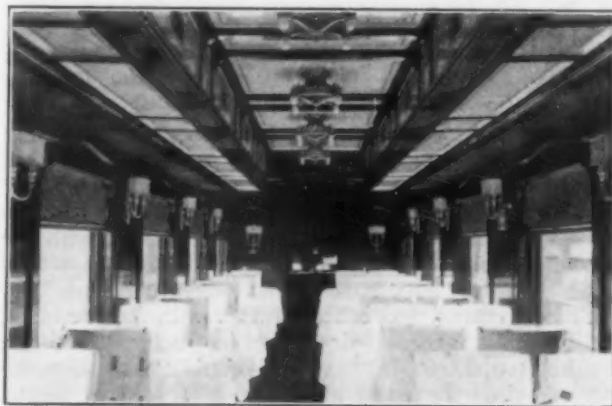
Parlor End of Observation Car

Railway Supply Company, Chicago, are of a mottled maroon and silver. Windows of more than the usual height, with stationary outer sash set in rubber, combine greater vision and freedom from outside dust and draft.

Another innovation is the electrical refrigeration provided in the dining car, which avoids the necessity of stops for icing and tends to assure the serving of food always strictly fresh. The latest mechanical aids are provided in the kitchen, all the working surfaces of which are covered with nickel steel.

The compartment drawing room cars are identical in design and furnishing with the other sleeping cars, except that the upholstery color scheme of the rooms is in

alternate blue and tan. The rooms, not only in this car but in drawing rooms and compartments of the open sleeping cars, have bronze reading lamps with mica shades and, for general illumination, have on each cross partition a two-light bracket lamp with iridescent glass shades, while at either side of the washstand mirror is placed a bronze candelabra fixture. A reading lamp is also provided at the sofa in the drawing rooms in addition to the section lamps. Other special features include a clock in each room, with small electric night lamp above it, electric circulating fans and individual heat control, a shoe servitor accessible from the inside as well as from



Artistically Decorated Dining Car Interior

the corridor, so that shoes may be removed for cleaning without disturbing passengers; a small door-knocker instead of a buzzer; and a cabinet for toilet articles.

The single-room observation car contains six individual bedrooms with regular beds, each room being designed for occupancy by one person and having a single bed with deep box spring, thick comfortable mattress and silk spread. These individual bedrooms were described in detail in an article on page 1071 of the *Railway Age*, of April 2.

In addition to the individual bedrooms, the observation parlor and women's lounge is an added feature of this car. The women's lounge is roomy, with four comfortable arm chairs, console table, mirror and completely equipped dressing room, finished in dull ivory enamel. The Spanish motif of color and design is again carried out in the parlor which contains a 4-ft. writing desk facing the windows at one side and provided with a writing lamp, a library table and magazine rack on the opposite side. The seating arrangement is unusual in that six large and comfortable chairs are provided, in addition to the usual armchairs and couches. Bronze side bracket wall candelabra add to the beauty of the room. The recessed and semi-enclosed observation platform, with brass capped railing and gates, has steps on one side only, in accordance with the latest practice.

NEGLECT OF GOGGLES COSTLY.—The state of New York, through its insurance department, keeps a record of injuries in industrial occupations, and for the 12 months ending with June, 1926, reports that 720 workmen lost the sight of at least one eye and that these injuries cost the employers of the state \$1,300,000 in compensation. The report shows that 349 persons suffered total loss of the sight of one eye and seven lost completely the sight of both eyes. These accidents resulted in an estimated loss of working time equal to 70,000 weeks. It is calculated that eye hazards in the industries of New York state are costing employers—and through them the general public—about \$5,000,000 a year.

Air Brake Association Holds Convention at Washington

*Addresses by Frank McManamy and R. H. Aishton
feature the first day's sessions*

OVER 1,100 members and guests were registered at the opening of the thirty-fourth annual convention of the Air Brake Association which was held at the Mayflower Hotel, Washington, D. C., May 24 to 26, inclusive. This was the largest attendance at any convention ever held by this association, eclipsing by nearly 300 the attendance at the convention held last year at New Orleans, La., which was the largest ever held up to that time. The exhibit was also one of the largest that has ever been held in connection with the annual convention of the Air Brake Association, a total of 80 individual supply companies being represented.

The convention was called to order with the president, M. S. Belk, general air brake instructor, Southern, Washington, D. C., in the chair. After the usual opening exercises the convention was addressed by Frank McManamy of the Interstate Commerce Commission and by R. H. Aishton, president, American Railway Association. These addresses were followed by the report of President Belk, who made a number of recommendations for the consideration of the executive committee among which were that the executive committee be increased from five to seven members, and that when it met to select a place for holding the annual convention representatives of the Air Brake Appliance Association be notified and invited to attend.

Commissioner McManamy's Address

The keynote of Commissioner McManamy's address, of which the following is a summary, was the common goal towards which the government, through the Interstate Commerce Commission and the railroads, through the various railway associations, are endeavoring to attain, namely, safe and efficient railroad transportation. The air brake is not only a safety device, but it is also a time saver and a dividend payer. It is just as important, he said, to make a smooth stop as it is to make a quick stop. The accomplishment of both of these requires men of trained skill and an idea of the problems that must be solved is perhaps best illustrated, he said, by the fact that the rate at which the air brake must do its work is about six times that of the work performed by the locomotive in starting the train.

Mr. McManamy expressed the belief that there is a real need for a more uniform standard of maintenance and mentioned the fact that the standards established by the Interstate Commerce Commission have been no more rigid than those recommended by the Air Brake Association. The Commission has practically followed the recommendation made by the Air Brake Association and according to the report of a recent investigation, he said, the present standards of maintenance are the highest they have ever been in the history of the country.

The railroads have not tried to evade the law relative to the application and utilization of new appliances and equipment, he said, but failures to comply have been due, almost entirely, to the lack of confidence in certain new features by the railway officers. As a result, the Commission has been required to do considerable educational

work. As an instance, he said, compliance with the rule relative to the control of trains by the use of hand brakes required a lot of education.

The Mechanical Division, A.R.A., and the Bureau of Safety have been co-operating in the formulating of a standard maintenance code, and Mr. McManamy said that the Air Brake Association is having no small part in this work, as one of its past presidents, Geo. H. Wood (Atchison, Topeka & Santa Fe), is chairman of the Mechanical Division committee.

The number of defects and violations discovered are constantly decreasing. It is now generally appreciated by railway officers that the laws regulating the safety of railway transportation have many advantages, and they now insist on compliance, he said. This attitude he considers to be due to the work of the various railway associations and the increased activity on the part of the members in recent years. In the early years of railway association activities, Mr. McManamy said, the members attended the annual conventions on their own time and at their own expense, but that now they attend as authorized representatives of the railroad with which they are employed. The work of the associations is becoming of greater importance to the industry and he said that the Interstate Commerce Commission wants to co-operate in every way possible with any organization working along the same lines as the Air Brake Association.

Address by R. H. Aishton

R. H. Aishton in his address stressed the fact that there has been a most profound change in public opinion regarding the railroads during the past four years. Two of the most important factors in this change of attitude he considered to be the increased competition from other forms of transportation and the providing of better and more efficient service on the part of the railroads. The railroads, he said, have derived more benefit from motor competition than they have suffered harm through the loss of passenger or freight business. Developments in new fields of transportation are bound to occur, he said, witness the recent flight of Captain Lindbergh from New York to Paris. However, regardless of new developments, he considers the railroads fully able to take care of themselves.

"One of the things that has made this speeding up of service possible on the part of the railroads," he said, "has been the development of the air brake which has now reached the highest point in satisfactory service ever attained so far as train operation is concerned. Not only is the air brake a material factor in safety, but due to having a dependable braking system, the railroads are able to obtain more nearly maximum efficiency out of their locomotives because trains can be operated with less wastage of time in stopping and starting. Delays along the line, which in the past have been at times responsible for serious accidents, are also now being reduced owing to fewer air brake troubles.

"The fullest co-operation exists between the Bureau of Safety of the Interstate Commerce Commission and

the railroads in respect to the adoption, promulgation and enforcement of regulations relating to the use of air brakes. These rules and regulations represent a practical minimum requirement. They are not 100 per cent perfect, but the problem is not so much to make the rules better, but to see that they are observed. As a result, according to the last annual report of the Bureau of Safety, 'It is now universally conceded that air brake conditions throughout the country are the most satisfactory ever known, both with respect to law compliance and satisfactory train operation.' In behalf of the railroads of this country, I can assure the Commission of their appreciation of this spirit of co-operation and of their desire to take advantage of every method leading to safety, economy or efficiency."

Following these addresses a tribute was paid to the late F. M. Nellis, who was secretary of the association from 1899 to 1926. The convention then proceeded to the presentation and discussion of the various reports and papers, summaries or abstracts, some of which are given herewith.

Standardization of Braking Power of Freight Cars

F. K. Vial, vice-president and chief engineer, Griffin Wheel Company, Chicago, presented a paper, illustrated with slides, on Standardization of the Braking Power of Freight Cars. Mr. Vial discussed with considerable detail the various factors entering in to the selection of the present braking ratios for various types and classes of cars. The wide variation between the light and loaded weights and in the loaded weight itself, makes the problem of providing suitable braking power exceedingly difficult. It is due to the fact that the braking power adopted as standard for different types of freight cars does not meet the average operating requirements that causes the majority of wheel failures. This, he says, is particularly so in the case of refrigerator cars. He proposed a revision of the present standards for braking power for 30, 40, 50 and 70 ton capacity cars, with the object of obtaining a more uniform retarding force throughout the length of the train. His recommendations amounted to from 5 to 15 per cent increase in braking power, according to the type and capacity of the car. His paper and recommendations were referred to the executive committee of the association for the consideration and possible further investigation by a committee.

Air Brakes and Foundation Gear for Gas Rail Cars

The paper on Recommended Practice on Air Brakes and Foundation Brake Gear for Gas Rail Cars, contributed by the Central Air Brake Club, included a description of the various types of air brake apparatus used on motor-rail car equipment. Relative to various features of brake design affecting the operation of motor-rail cars, the report stated as follows:

The present gas rail and gas electric motor cars are closely similar in their details of construction and operation to standard traction or electric railway units in service today. The gas electric truck is a traction truck, and although in the gas rail truck the motors are replaced by the differential and drive shaft, the fundamental controlling factors actually put this truck in the traction class, especially the power truck. For these reasons, these cars have been braked in accordance with traction standards; that is, 100 per cent brake ratio based on 50 lb. cylinder pressure.

Motor car trains with a standard passenger coach as a trailer will, therefore, have a more effective brake on the motor car than on the trailer, in the ratio of 100 to 75 for a full service application. The slack action in a two-car train under these conditions was thought would

not be noticeable, and the tendency would be to keep the slack in during a brake operation. One reason for using a higher ratio for these units than the steam road passenger ratio of 90 per cent on 60 lb. is that considerably shorter stops could be secured with a higher ratio, with which there is greater protection against wheel sliding than on standard passenger cars, for the brake control is much more flexible. Due to the fact that the feed valve pressure is available with a straight air application, restricted slightly, however, by the spring in the double check valve, the full straight air service brake ratio is 135 per cent approximately. The high emergency feature of the triple valve also provides for 135 per cent approximate brake ratio in emergency.

The short wheel base of these trucks requires the use of the single shoe type of brake rigging, and on account of the installation of a drive shaft and differential on the gas rail trucks and the motor on the gas electric trucks, the truck levers should be located between the wheel treads and connected to the pull rod through the medium of an equalizer bar. Because the shoes must be considerably below the wheel centers to prevent journal displacement and tilting, and to allow for rail clearance of the bottom rod, truck ratios should be comparatively high, and the total possible travel of the live truck lever is limited so that on most trucks that is the primary point of brake rigging fouling with excessive shoe wear. With these limitations, therefore, it is obvious that a brake rigging with a nominal initial brake cylinder piston travel of approximately 5 in. will permit of a greater linear shoe wear than a similar rigging with 8 in. initial travel; i.e., with 5 in. initial piston travel the car can make greater mileage between bottom rod slack adjustment take-up periods than with 8 in. initial piston travel.

For these reasons the traction standard of 5 in. nominal piston travel should be adopted for these equipments and auxiliary and supplementary reservoirs should be accordingly reduced in size so that full equalization only will be obtained with a 20 lb. reduction off of 70-lb. brake pipe pressure with the brake cylinder travel at 5 in. Gas-rail and gas-electric brake equipments should, therefore, have auxiliary and supplementary reservoirs of smaller size than has previously been standard for steam road service where the piston travel has been based on 8 in.

Recommended practice for the total maximum leverage ratio on steam road passenger cars varies from 9 to 1 with 8 in. and 10 in. equipment to $5\frac{1}{2}$ to 1 with the double 18 in. Traction car recommendations, however, permit the use of a 12 to 1 total leverage ratio, though 10 to 1 is acceptable as a maximum where it is feasible for the particular car design under consideration. On account of the traction characteristics of these trucks, the recommendations are for the traction standards, i.e., with a maximum total leverage ratio of 12 to 1. This recommendation is logical and based on engineering requirements.

It was also recommended that trucks and car bodies should be so designed as to permit full piston travel without interference of any of the parts and permit the use of total lever ratio as recommended for standard steam road passenger cars.

It was the consensus of opinion of those who discussed the paper that the air brakes and foundation brake gear of motor rail cars should be designed so that equipment of this type could be used with the regular steam railroad equipment. There are times when it is necessary to dead-head a motor rail car in a train and it is also sometimes necessary to attach trailers, even though the motor rail car may have been designed for use without trailers. The utilization of motor rail car equipment with other

equipment should not be limited by the design of the air brake.

Brake Pipe Leakage

The work of the Committee on Brake Pipe Leakage during the past year was confined largely to an investigation of brake installations on freight cars in service and to the development of a proposed form of brake system leakage testing device. Some leakage tests were made during this year along the same lines as those described in two previous reports submitted by the committee, which were sufficient to show that brake pipe systems leakage conditions are improving rapidly.

The proposed form of brake system leakage testing device now being tried out is designed to provide a more adequate leakage and operation test for any length of train, from 10 to 100 cars. Instead of having only a 1¼-in. orifice, as in the device formerly used by the committee in its tests and now used by a number of railroads, the proposed testing device has 10 orifices of different diameter for regulating the flow of air through the testing device. The first orifice is used for testing trains of about 10 cars, the second for 20 cars, and so on up to trains of 100 cars. The orifice can be changed to suit the length of trains, so that both the leakage and release tests will have a severity regardless of train length equal to that of the limits provided by the present testing device for a 100-car train. In addition, the provision of a quick-charging feature speeds up the work of testing and inspecting outgoing trains at terminals.

The committee, in its report, stressed the need for doing a good mechanical job when installing the brake equipment, especially when building or repairing freight cars. A number of methods for mounting angle cocks on freight cars, the breaking off or damaging of which is the most prolific source of brake pipe leakage, were shown and discussed. It was generally agreed that improved methods of installation and the working out of better and more efficient methods of testing trains in terminals was necessary in solving the problem of brake system leakage.

The report of the committee is well summarized in the conclusions and recommendations with which it closed. These are as follows:

Conclusions

1—That adequate leakage and operation tests of freight trains before departure from terminals will serve to detect brake equipment defects which materially decrease the efficiency of brake operation.

2—That the proper repairs of defects as such tests will detect will serve to reduce delay caused by stuck brakes, slid flat wheels, etc., and the tests provide a check on poor quality repair work.

3—That many conditions which contribute to brake system leakage are unnecessary and can be eliminated by proper provision in the brake equipment installation design.

4—That the angle cock with supporting flange will provide a good mechanical construction basis for fixing and maintaining the angle cock in its proper location, thereby avoiding unnecessary strains in the piping and avoiding leaks due to improper position of the hose.

5—That metal joint unions are preferable to ordinary unions for use in brake equipment piping.

6—That the use of straight tapped pipe fittings in brake equipment piping is undesirable.

7—That better mounting of brake cylinders and reservoirs is desirable because if these parts can be permanently held in a fixed position, damaging strains on the piping and fitting will be avoided and maintenance cost will be correspondingly reduced.

8—That maintenance cost can likewise be reduced on old cars if branch pipes and crossover pipes are installed to have flexibility and thereby avoid strains at the devices and the threaded joints.

9—That the use of reinforced pipe fittings is warranted by the severe conditions which surround piping in freight car service because those fittings will make the equipment more nearly leak proof and thereby avoid a maintenance expense which goes on continuously.

10—That the standard A. R. A. brake pipe leakage test is inadequate because it is not dependably accurate at leakage rates greater than 5 lbs. per minute.

11—That the limit rate of brake system leakage suggested in the last committee report is not too low. (The limit suggested was fixed at 36 cubic feet of free air per minute for a train of 100 cars or less).

12—That the proposed form of the brake system leakage testing device will provide means for testing trains of any length up to 100 cars with uniform severity.

Recommendations

1—That this association refer the question of making leakage and release tests on freight trains in terminals to the American Railway Association with a view to making such tests together with proper repairs, standard A. R. A. practice.

2—That the suggested modification of the present standard and brake pipe leakage test described in this report be submitted to the American Railway Association for consideration.

3—That the suggested leakage limit for brake system leakage be studied with a view to reducing it from 36 to 25 cubic feet of free air per minute.

4—That brake installation design be made a regular division of study in the recommended practice of this association.

5—That the angle cock with supporting flange be made standard on all new cars and methods devised for using it on all cars when old style cocks must be replaced.

6—That reinforced pipe fittings be given a more extensive trial by specifying them for cars in heavy load service.

7—That brake cylinders and reservoirs together with their mounting brackets be drilled with accurate jigs to insure a more permanent and rigid mounting.

8—That when necessary to repair broken branch and brake cylinder pipes, such pipes be replaced by a flexible combination which will present the transmission of strains to the pipe joints and brake equipment devices.



Cholerton Photo

Reading Coal Train Bound for Port Reading, N. J., Passing Trenton Junction

Are Accounting Reserves Sound?*

Describing the differences between the depreciation and retirements method of accounting for service loss of value

By Henry Earle Riggs

Professor of Civil Engineering, University of Michigan, Ann Arbor, Mich.

Part II

ENOUGH has been said to bring out the fact that reserve accounting for replacement or so-called "depreciation" has come into comparatively recent use.[†] The telephone companies have been its great advocates in recent years. The annual report of President Theodore N. Vail of the American Telephone & Telegraph Company in 1911 presents the extreme views of the advocates of reserve accounting. An examination of the reports of this property indicates that the system has great merit from the standpoint of the owner of a large and prosperous property. It would also seem to indicate that there may be considerable question as to the system from the standpoint of effective regulation. The Interstate Commerce Commission has accepted Mr. Vail's views fully in the accounting system prescribed for the telephone companies, and has approved the method of direct charges to operating expenses in the accounting classifications of the railroads.

Accounting for Depreciation by

Reserves or Direct Charges

The method of direct charges, or the replacement method, has been in use from the beginning of the railroad industry in 1830 to the present time, and has been exclusively used as to way and structures. The Interstate Commerce Commission has required depreciation accounts for equipment, and in recent years has left it optional with the carriers whether or not they would be used for way and structures.

It must be remembered that from 1878 to 1909 reserve accounting was frowned upon by the Supreme Court and that from the beginning of accounting regulation in 1907 to the present time the establishment of reserves has not been mandatory. Hence it would seem that if they are now to be required, there should be full recognition of the historical facts, and the system should be applied to present conditions as to the capital accounts, without any deduction therefrom for a purely theoretical "depreciation" which has never been collected for, and which in point of fact is a wholly imaginary thing.

The railroads have, in the past, collected each year all their allowances for depreciation, and have spent the money so collected in making good all losses accruing during the year. The studies of railroad operating expenses which the writer has been privileged to make on a number of carriers, large and small, show the percentage of annual maintenance to total investment, by groups, of such magnitude as to clearly prove that where there has been full maintenance there can be no depreciation. Hence, in beginning a new system of account-

ing there should be no deduction for a "theoretical accrued depreciation" which somebody computes by some "method."

The point to be emphasized is that properties are not alike,—that no general rule of accounting can be formulated which is capable of universal application. There are properties, like the waterworks, which need and must have a system of reserves. There are properties, like the large railroads, which secure exactly the same uniformity by the direct charging of the replacement or retirement to operating expenses in the year in which it occurs. There are properties, many of them, which may need to establish reserves for certain costly parts of the property, the retirement of which would, if charged in one year, greatly disturb the uniformity of the ratio. These considerations lead the writer to the conclusion that each property must be studied in the light of its own conditions and facts, and that the accounting methods to be adopted ought to be left as a question of policy to be determined by the management, subject of course to the full approval of the regulating bodies in control. Above all, it must be remembered that the methods of accounting which may be appropriate for private industry, are not necessarily applicable or desirable for public utility property, which is of continuing life.

Space permits the noting of just one other point regarding the two accounting plans. The *replacement or direct charge* to operating expense deals with *property*, not dollars of cost. Twenty miles of 90 lb. rail, costing originally \$30 per ton, is replaced with rail of the same weight costing \$45 per ton. Operating expense bears the added \$15 per ton in exactly the same way that it bears the higher labor cost or the increased price of coal burned by the locomotives. Nothing is added to the railroad. It has no greater size or capacity after the rail replacement than before. Operating expenses merely reflect a higher general level of cost than prevailed in earlier years.

The *reserve accounting method* deals with *dollars of cost*, not property. In the example given above the original cost of \$30 per ton is retired through the accounting reserve, and, if the plan is to be consistently carried out, the \$15 per ton of added cost must be provided for out of capital. Under this plan the fixed capital account must reflect the effect of changes up or down in the price level as they appear in the cost of replacements. The well known argument that the new facility is of different type and larger, while it undoubtedly applies in the case of bridges, buildings and equipment, loses force when applied to ties, rails and many other very large accounts.

The General Use of Reserves

Questionable as Sound Public Policy

The writer looks upon the plan of reserve accounting as being highly desirable in its proper place and when

*The first part of this article appeared in the *Railway Age* of May 14, 1927, page 1461.

†The Interstate Commerce Commission in the recent depreciation case, No. 15100, referred to what Professor Riggs calls reserve accounting for replacement as "depreciation accounting" and what he terms the method of direct charges or the replacement method as "retirement accounting."—Editor.

properly used, but as unsafe and difficult of control if its general use is permitted or required. It is entirely possible to so establish reserves as to result in uniform maintenance charges in each month and each year, a condition which would be ideal if there could be the assurance that the reserves were properly and correctly established and the system kept free from abuse. The adoption of reserve accounting will result in substituting estimates in place of the recording of actual expenditures. It would tend to destroy the statistical value of the operating expense accounts covering maintenance, and would compel an investigation and analysis of the reserve accounts to secure the true facts whenever they were needed.

The writer is old fashioned enough to want the accounting to be a record of actual transactions and not an exhibit of estimates. He is also old enough to know that human nature is pretty much the same the world over, and apt to convert such a system to its own ends if occasion arises. The value and dependability of such a system depends therefore on excellence of supervision of the regulating commission and such supervision is not possible without great expense and a large, competent and dependable staff.

The adoption of a general system of reserve accounting on railroads is certain to complicate the accounting greatly, if estimates are to be made of reserves for particular items of property. The accountant's personal knowledge of the property, which is entirely possible on a large waterworks system, located in one community, or in the case of large bridges or buildings or other special structures of sufficient magnitude to call for reserves on a large railroad system, or even on all parts of a railroad property small enough to justify full reserve accounting, is quite impossible on a system of from two to ten thousand miles. Such knowledge is essential if accurate estimates are to be made.

If reserves are to be established for all parts of all properties, the complications brought about by the different maintenance requirements of different carriers, and the difficulties of establishing proper average percentages on large carriers must not be minimized. The replacement requirements per equivalent main track mile, vary so greatly on different roads, and on different lines of the same carrier, that it is almost inconceivable that any wholly satisfactory plan can be worked out.

A further complication, which will be very evident to anyone who has made a close study of recent changes in price level, is the fact that, the capital accounts being established on the investment or original cost basis and remaining the same year after year, the *percentage of cost spent for maintenance* increases or decreases with the price index. That is, if 3 per cent was a sufficient allowance for a certain structure in 1914, it would require more than 6 per cent to suffice in 1926, because the railroad dollar of maintenance in 1926 would not purchase as much as forty-eight cents would in 1914. This being true the constant dissatisfaction with any probable reserve allowances must be reckoned with.

From the standpoint of public policy the principal objection to the system of reserve accounting is the fact that its inevitable result will be the accumulation in a few years of vast credit balances in the reserves, a large part of which are useless and unnecessary. For example, the theoretical condition of normal maintenance of ties is 50 per cent. That is to say, if we begin accumulating a reserve for ties on a new railroad, the time will come when all of the ties are in 50 per cent condition, and the credit balance in the reserve will equal 50 per cent of the investment in ties. Any credit balance in this account (save such small reserve sufficient to provide

for normal renewals over a two or three years' business depression) is excessive, because when ties reach that *theoretical* condition annual replacements balance accruing depreciation and uniform condition continues indefinitely so long as full maintenance is kept up. Therefore the reserve can never be used.

The accountants, and a number of commissions have held that this credit balance, a liability, is to be deducted from the assets in determining the true value of the assets. The present attitude of the courts raises a very serious question as to the soundness of this, and also a question as to the policy of encouraging or permitting large reserves. The views of the courts will be referred to later.

There are a number of ethical questions concerning reserves which cannot be touched upon for lack of space in one paper. The attempt is here made to indicate very briefly some of the difficulties of administration and regulation that will certainly follow any attempt to compel universal adoption of a plan of accounting which substitutes personal estimates for a recording of actual transactions, which will destroy the value of the published reports of the commission for purposes of comparison, and which will result in the establishment of reserves having credit balances of hundreds of millions of dollars. This is, it is true, one way of providing out of earnings to keep the investment intact. If it be recognized by the public and the public regulating bodies that the *entire* cost of keeping the railroads of the company up to a proper standard of efficiency is an operating expense, then it does not matter much to the railroads how the accounting is done. If, however, this plan is used to compel the railroads to find new capital to cover all added expense of replacement in times of rising prices, and to deduct from the capital account the lower cost of replacement in times of falling prices, then a question of policy vitally affects the owners of securities. The one great outstanding accomplishment of the Interstate Commerce Commission has been to establish uniform accounting and to do away with that "vest pocket book-keeping" complained of in its first report, and it seems inconceivable that there can be an approval of any system which will make possible a return to old conditions through a system which substitutes estimate for fact in all operations.

How the Courts Have Viewed

Accounting Reserves for "Depreciation"

Reference has already been made to the Kansas Pacific Case, 99 U. S. 455, in 1878. This it must be remembered was long before general regulation. Thirty years later, in the Knoxville Case, 212 U. S. 1, it was emphasized that it was the right and duty of the company to provide, *out of earnings*, a sufficient sum annually to provide not only for current repairs but for making good the depreciation and replacing the parts of the property when they come to the end of their life, to the end that the investment be kept intact and remain as it was in the beginning. No specific plan of accounting is referred to in this case.

Six weeks later, on Feb. 23, 1909, in the Cumberland Telephone Case, 212 U. S. 414, the Supreme Court recognized the propriety of reserves, saying, "That it was right to raise more money to pay for depreciation than was actually disbursed for the particular year there can be no doubt, for a reserve is necessary in any business of this kind, and so it might accumulate, but to raise more than enough money for the purpose and place the balance to the credit of capital upon which to pay dividends cannot be proper treatment."

In 1912, Justice Lurton, in the Lincoln Gas Case,

223 U. S. 349, referred to the danger of double deduction first through the payment for replacement items as they occur, and also by a contribution from income through reserves. He also said, "Then the amount to be set aside for future depreciation will depend upon the character and probable life of the property and the method adopted in the past to preserve the property. It can be readily seen that the amount to be annually set aside may be such as to forbid rate reductions because of the requirement of such a fund" (reserve).

In the *Kansas City Southern Case*, 231 U. S. 423 (1913) there is also a recognition of the fact that the using up of property units is a charge against operating expenses. "The railroad company may, if it sees fit, anticipate general depreciations and make provision for them by establishing a reserve for that purpose; but if no such provision has been made the abandonments should be taken care of by charging them to present or future operating expense." Thus it appears that from 1909 to the beginning of the world war the Supreme Court recognized the necessity of keeping investment in utility property intact, held squarely that this must be paid for out of operating expenses, recognized distinctly both methods of accounting, but held that reserves must not be excessive and that there must be no duplication of charges by the use of both methods.

A number of recent cases throw a new light on this question of reserves. The report of Theodore N. Vail of 1911, was referred to above. The company began in the following year to set up reserves designed to be large enough to cover lessening of value of tangible property from wear and tear, not covered by current repairs, obsolescence, inadequacy and extraordinary casualties. In the 15 years since their establishment credits have greatly exceeded debits, so that now in the different states there is a credit balance in the reserves running into hundreds of millions of dollars. The company in cases recently heard, protests the deduction of these reserves as "depreciation" in the determination of a rate base. It claims that depreciation, in the sense that it should be deducted, is only the actual observable depreciation determined by inspection, and insists that the credit balance less this observed depreciation belongs to it as much as any of its property and that it is entitled to earn a return upon it. It further claims that, while admittedly treating obsolescence as an element in the reserve, there should be no deduction on account of obsolescence in finding depreciation in a rate base. These proceedings raise issues that must be faced if reserve accounting becomes universal. Can the credit balance be deducted from value in finding a rate base? Is obsolescence a factor to be considered in the reserve? Is it possible to prevent excessive reserves? Who owns the reserves?

In *N. Y. Telephone Co. vs. Prendergast*, 300 Fed. at pages 824 and 825 it was held that the deduction of the entire depreciation reserve was in error, that the depreciation reserve is a piece of bookkeeping to provide means for minimizing future losses and that "the legal error is in not recognizing that the law requires deduction only for actual depreciation, just as actual as the present value, and the extent of that depreciation must be ascertained by the same kind of evidence; in the last analysis, opinion based on contemporary investigation."

In *Utility Commissioners vs. New York Telephone Co.*, 70 L. Ed. 436, the commissioners having found that there was more money in the depreciation reserve than was necessary, and having directed that part of it be used to make up deficits in any year when earnings were less than a reasonable return, the court said, "The law does not require the company to give up for the benefit of future subscribers any part of its accumulations from

past operations. Profits of the past cannot be used to sustain confiscatory rates for the future. * * * The property or money of the company represented by the credit balance in the reserve cannot be used to make up the deficiency."

Credit Balances in Reserves

A number of other recent cases seem to establish a considerable line of precedent to the effect that credit balances in the reserves do not constitute deductible depreciation; that reserves cannot be used to make up deficiencies due to insufficient rates, and even that a commission cannot compel the use of money collected through the reserves to bring a run down property up to standard through repairs. (*Landon vs. Court of industrial relations*, 269 Fed. 433.)

Considering all of the decisions of recent years, along with the facts as to maintenance by the railroads through direct charges to expense, the writer is of the opinion that there are very grave questions of public interest involved, as well as of private interest in the case of carriers whose earnings are not sufficient to permit this form of accounting. If carried out, as proposed, it will create numerous new and grave questions for many carriers, although there are probably a few large and prosperous companies that would not be adversely affected.

This accounting plan has undoubted merit for the treatment of special cases in which it is desirable to spread large recurring costs over a period of time. For some utilities some such accounting is necessary. For some small railroad properties, and for large structures or parts of large railroads it has merit. In general it is not necessary in railroad accounting, as the renewals come with sufficient regularity to give a uniform operating ratio, which is the only reason for adopting the plan of reserves. This system is distinctly on trial. It is objectionable because it is complicated, it substitutes in the operating expense accounts, estimate or conjecture for a record of actual expenditures, and thereby destroys the comparative value of these accounts.

If adopted, it may result in some carriers securing excessive allowances, or in commissions compelling the use of insufficient allowances, and the adoption is certain to develop a series of new and vexatious complications which can only be settled by long, tedious and costly litigation.

Wage Demands of Southeastern Firemen

WASHINGTON, D. C.

THE hearing before a board of arbitration on the demands of the Brotherhood of Locomotive Firemen and Enginemen for increases in wages which in general range from \$1 to \$1.25 a day for firemen employed on eleven southeastern railroads was still in progress this week. Following the opening testimony of D. B. Robertson, president of the men's organization, which was reported in part in last week's issue, a number of individual firemen having different types of runs and locomotives were called to testify regarding their working conditions, their earnings and their living conditions.

Mr. Robertson pointed out that the increase asked goes up to \$2.69 per day in some instances because of the proposed increase in the number of gradations of locomotives above 275,000 pounds, for which the highest rate is now \$6.51.

He said a fireman was called upon to shovel from 5 to 25 tons of coal per trip and that the grate area to be covered had increased from 50 to 70 square feet to about 100 square feet. The average tractive power of locomotives had increased from 21,781 pounds in 1903 to 40,666 in 1925, he said, and the average for the southern district was higher than in the West, although a little lower than in the East. Mr. Robertson presented a tabulation showing the names and service dates of the three senior firemen on each road included in the arbitration agreement, including the dates they entered the service and the dates they were promoted to engineer, although they were in service as firemen on April 1, 1927. The three on the Atlantic Coast line had been in service ten years each and two had been promoted to engineer seven and three years ago, respectively. He also went into details regarding the physical and mental strain on a fireman, the hazards of the employment and the requirements for promotion.

"Occupational Expenses"

When Mr. Robertson made the point that there were certain "occupational expenses" that a fireman must meet, including expenses away from home and the cost of insurance, W. A. Northcutt, counsel for the Conference Committee of Managers, objected to testimony as to the away-from-home expenses, on the ground that an agreement had been reached that the existing rules should be continued in effect for a year from March 31, 1927, and that this amounted to a withdrawal of the rule proposed by the brotherhood which contemplated a specific allowance for meals and lodging away from home. Mr. Robertson contended, however, that for this reason the expenses of that character should be taken into account in considering proper wage rates, and the board overruled the objection. Mr. Robertson said that in 1922 his organization had made a study by means of a questionnaire of the away-from-home expenses, which indicated that they amounted to an average of 12½ per cent of the firemen's pay checks. He also estimated the cost of insurance at \$9 to \$10 a month.

Mr. Robertson presented an elaborate exhibit to show that the real wages of firemen have decreased in comparison with the cost of living and the union wage scales for other classes of workers, since 1903. This, he said, would support a request for an increase of \$2 per day or more. The exhibit was based on what Mr. Robertson called representative rates from the Norfolk & Western schedule for the "dominant" class of locomotives, compared with their purchasing power, based on the cost of food from 1903 to 1913 and the cost of living figures of the Bureau of Labor Statistics for later years. In 1903, this showed, the dominant rate of pay, \$2.23, had a purchasing power of \$2.97; in 1913, the dominant rate of \$3.10 had a purchasing power of \$3.10; in 1918 the rate of \$4.96 had a purchasing power of \$2.49; in 1920 the \$6.00 rate had a purchasing power of \$2.99; in 1926 the rate of \$5.72 had a purchasing power of \$3.26.

Wage Comparisons Made

Mr. Robertson then presented a comparison of the average union wages of 1925 and 1926 for an eight-hour day for the United States, including 70 groups, with the 1913 rates taken as an index figure of 100, and, starting with a rate of \$3.10 for firemen in 1913, he applied the average percentage increase in union wages to show what the fireman's wage should have been in subsequent years if his wages had increased in the same proportion. On this basis the \$3.10 rate should have been increased to \$4.79 in 1919, he said, against an actual rate of \$4.16; to \$6.17 in 1920, as against an actual rate of \$6.00; to

\$7.37 in 1925, as against an actual rate of \$5.72, and to \$7.76 in 1926 as against an actual rate of \$5.72. To make the 1926 rate equal to the average wage for skilled labor, he said, the request should have been for \$9.18 instead of \$6.72, for a "normal day's work" of 100 miles or eight hours in freight service.

Mr. Robertson also gave some statistics relating to the standard of living to show that "the fireman's wage is a decreasing one 'because' while the whole nation is participating in this great growth or great wealth of the country, he cannot participate to the extent his associate skilled workers can because his wages have fallen below in so far as the purchasing power of his wages is concerned, compared with the purchasing power of the wages of his associate workers."

This was followed by statistics to show "to what extent the railroads have participated in this great increase of the business of the country," including the increase in the business handled, etc., and an increase of 29 per cent in the tractive power of locomotives in the southern district from 1915 to 1925, and an increase of 51 per cent in the revenue tons per train.

Hazards of Work

Mr. Robertson put in the record an exhibit containing statistics drawn from numerous sources, including the insurance records of the brotherhood, and for various series of years as evidence of the "occupational hazard" of firemen as compared with that of other occupations. He said there had been a considerable improvement in recent years, as illustrated by the fact that in 1889 there was one trainman killed for each 117 in service whereas in 1925 there was only for each 452 in service. However, he said, one in 12 was injured in 1889 but one in 11 was injured in 1925. He had no separate figures for the firemen on the 11 roads in the arbitration.

Under cross-examination by Mr. Northcutt it was brought out that much of Mr. Robertson's testimony as to earlier years had been considered in previous proceedings involving wage increases and therefore that some of the changes in conditions had been taken into account in arriving at the present wage rates. It was also brought out that much of it did not apply to conditions on the eleven roads involved and Mr. Robertson said he knew of no locomotive on any of them having a grate area of 100 square feet that was not stoker-fired. Mr. Northcutt also brought out that according to the exhibit filed the fireman's wage had a greater purchasing power in 1926 than in any year back to 1903, in terms of 1913 dollars, but the witness said the figures should also be compared with the wages in other classes of employment.

Fireman Testifies

I. P. Sullivan, a fireman in pool freight service on the Nashville, Chattanooga & St. Louis, who had been in service for seven years, testified as to his experiences on a run between Atlanta and Chattanooga, 136 miles, with three sizes of engines. He said his average rate is \$5.84 a day including some over miles and overtime, and that for the year from May 1, 1926, to May 1, 1927, he earned \$2,132.71, a monthly average of \$177.72, and that his away-from-home expenses average \$22.50 a month. He makes ten round trips a month averaging about eight hours each way, he said. He also gave some details of his average monthly expenses at home, \$150 a month, including a \$25 a month payment on his home. He said that the stokers are a relief in saving the handling of 13 to 17 tons of coal per trip but that the more powerful engines on which they are used tend to keep him from promotion.

Educating Drivers as to Hazards

Northwestern Pacific has fewer accidents each year since campaign of education was inaugurated

By William S. Wollner

General Safety, Fire Prevention and Welfare Agent, Northwestern Pacific Railroad Company

DESPITE an increase in the number of crossing accidents in California each year during 1924, 1925, and 1926, there have been fewer accidents during each of these years than during the preceding year at the crossings of the Northwestern Pacific which operates about five hundred miles of road in this state. Up to and including 1923 there were more accidents at this road's crossings each year than during the preceding year, but in 1924 there were fewer accidents than during 1923, and during 1925 and 1926 there were fewer accidents than during the preceding years, as shown in the following table and the accompanying chart:

Year	No. accidents	Year	No. accidents
1919.....	27	1923.....	59
1920.....	28	1924.....	54
1921.....	34	1925.....	51
1922.....	42	1926.....	50

The number of accidents is total; that is, every collision between an automobile and a train at a crossing is included regardless of the amount of damage done or whether it resulted in injury to a person.

For some years the Northwestern Pacific has, in common with other roads, eliminated or improved grade crossings where possible and has installed warning signals where it appeared that these would be of value to motorists or where required by the State Railroad Commission.

But as the Northwestern Pacific has followed this practice for many years without curbing the increase of accidents at its crossings, it is believed that this had very little, if anything, to do with the improved record during the past three years. This belief is strengthened by the fact that many of the accidents have occurred at crossings adequately protected with signals, or where the approach and view was so good that thought has never been given to grade separation or the installation of additional protection. It is the belief of this road's officers that the reduction in crossing accidents year by year, having been contemporaneous with an educational campaign for drivers which the road has been conducting, is in large part due to this campaign.

As stated, up to and including 1923 there were each year more crossing accidents than during the preceding year. Taking cognizance of this, it was decided in the fall of 1923 to see what could be done toward stemming the increase of this type of accident through an educational campaign for drivers. It was recognized that there are many drivers who are naturally careful and for whom no such campaign was necessary, and that there are other drivers who are habitually careless and upon whom any corrective effort would be wasted. It was decided, therefore, to concentrate upon drivers who, through ignorance of the hazard or through momentary

.....192..... (PLACE AND DATE)	
General Safety Agent: The following violation of Section, California statutes, was observed by me.	
Date.....	Hour..... p.m. Crossing.....
<input type="checkbox"/> Auto <input type="checkbox"/> Bus <input type="checkbox"/> Truck	License No.....
Name	
Occupation	
Other witnesses, if any:	
Remarks:	

California Vehicle Act, 1925.	
Section 73, subdivision (b), provides for a hearing to determine whether or not driver's license shall be revoked when he is proven to be chronically careless.	
Section 113, subdivision (b), provides for a restricted speed of fifteen miles an hour or less for all automobiles over any railroad grade crossing when driver's view is obstructed at any point within 100 feet of the crossing.	
Section 135 provides that all school buses and other auto buses, carrying passengers for hire, also, all trucks handling explosives or inflammable liquids, such as gasoline trucks, etc., shall come to a full stop between ten and fifty feet from nearest rail of track at every railroad grade crossing.	

R.R.E. Form 764 RM-11-4-25 O. 2044, WSP-48
GENERAL SAFETY AGENT, NORTHWESTERN PACIFIC RAILROAD COMPANY, 64 PINE STREET, SAN FRANCISCO.

Help Prevent Accidents at Crossings.
For several years the Northwestern Pacific has been trying to reduce the number of grade crossing accidents, and these efforts are being continued.
If you observe a driver violating the California Vehicle Act, or other safety regulations, use the card attached for reporting the incident to the General Safety Agent, who will obtain name of the automobile owner and communicate with such owner in the hope of making him realize the chances of accident he is taking.
Additional cards can be secured from Superintendents, heads of departments, or General Safety Agent.

The Two Sides of the Card Used by Employees in Reporting Violations of the California Vehicle Act

impulse, disregarded the precautions that should be observed at crossings. Due to the method of reporting violators, it was found necessary, in working out the plan, to throw the habitually careless and the transiently careless into the same group.

Reporting Violations

As the basis for reporting violations, it was decided to use Section 113 of the California Motor Vehicle Act which provides for a restricted speed of 15 miles an hour or less for automobiles over a railroad grade crossing where the driver's view is obstructed at any point within 100 feet, and Section 135 which provides that all school and other auto buses carrying passengers for hire also all trucks handling explosives and inflammable liquids, shall come to a full stop between 10 and 50 feet from the nearest rail of a grade crossing.

The road's entire personnel was asked to report violations of these two sections of the code and any other unsafe practices at crossings. A double card (illustrations of which appear) was prepared, the upper part of which provides spaces to be filled in by the observer, designating the place and time of the occurrence, the type of vehicle and the license number on one side, while the other side bears the address of the road's general safety agent and indicia which permits it to be transmitted through the railroad business mail. The lower card bears on one side the two sections of the Motor Vehicle Act mentioned above, and Section 73 which provides that a driver's license shall be revoked when he has been proven chronically careless. The other side of the card states briefly the purpose for which the reporting portion is to be used.

When the campaign was inaugurated in 1923 a supply of these cards, accompanied by a letter from the road's president telling of the conditions that made the campaign necessary and the hoped for correction, was sent to all employees. At the same time the proposed plan of action was featured in the road's employees' magazine. Up to this time the magazine had carried, almost monthly, articles telling of crossing accidents so that employees were informed as to the crossing situation. Superintendents and heads of departments assisted the plan by urging the reporting of all violations, and the fact that the personnel had been for several years keyed up to intensive accident prevention effort made much urging unnecessary. In the three years that have passed several thousand violations have been reported to the Safety Department, the *modus operandi* as follows:

As the cards reporting violations are received, the State Motor Vehicle Department is asked for the name and address of the owner of the license. A letter is then written him telling of the violation and asking that he acknowledge receipt, stating that he understands the chance of accident involved and that there will be no recurrence. If a satisfactory reply is received, the case is considered closed, but if a reply does not reach the Safety Department, a second letter is addressed to the violator. If this fails to get results, one of the A.R.A. crossing postcards is sent him with a note on the face asking for a reply, and if this is not forthcoming, a registered letter follows. In cases where it seemed advisable, personal calls have been made and the case explained to the violator or the owner of the car.

No form letters are used in this campaign. Each one is individual, although after a certain number had been written certain stock phrases became standardized. At the time the educational campaign was inaugurated it was customary when writing a letter to the owner of a car to assume that he was the violator. These letters did not bring as many replies as had been hoped for; a study of the text was made and it was decided that better results

might be obtained if the owner were given an opportunity to reply without incriminating himself. The text of the letter was changed so as to indicate the assumption that the owner of the car was not driving it himself at the time of the violation, and that he would be very much concerned to learn that an employee, or perhaps a member of his family, was taking risks in crossing the railroad's tracks. This was accomplished by inserting sentences reading, "We are informed that the driver of automobile bearing license number ———" and "Will you be good enough to advise that the matter has been taken up with the driver of your car."

It is a somewhat humorous sidelight on human nature that the changed form of the letter resulted in a very large increase in the percentage of replies. Many of the persons addressed availing themselves of the opportunity to use this loophole in their replies.

Another change that was made later and which resulted in a still further increase in the percentage of replies was the altering of the form of the letter so as to have it come from the road's employees rather than from the management. This was accomplished by inserting sentences reading somewhat as follows: "The twenty-five hundred employees of the Northwestern Pacific are very much interested in reducing accidents at crossings and have asked me to call your attention to this matter."

Other changes were made as the plan progressed so that at the present time the percentage of replies is satisfactory. An even greater satisfaction is derived from the tone of many of the replies. With some exceptions, most of the people addressed seem to appreciate the road's interest in protecting their lives and it is the contents of some of these letters that, in addition to the statistics, have heartened those in charge.

In order to maintain the employees' interest in reporting cases, the progress of the educational campaign has been covered in nearly every issue of the road's magazine. But what has probably done more than this to stimulate continued interest has been that every employee reporting a violation has been supplied with a carbon copy of the letter sent the violator and has, where it seemed wise to do so, been kept informed of just what has been accomplished in individual cases. Needless to say, the violator is never informed as to the identity of the reporter.

As a part of the educational campaign supplementing the handling of individual violations, talks have been given by the road's safety agent to chambers of commerce, luncheon clubs, and to high school student bodies. The crossing posters of the American Railway Association have been generously used and the A. R. A. crossing stickers have been attached to letters.

Sufficient justification of the effort required by this campaign (there was practically no expense) is contained in the road's crossing accident statistics. As stated in the early part of this article, up to and including the year in which the campaign was inaugurated, there were more accidents at the road's crossings each year than during the preceding year, while since that time there have been fewer accidents each year than in the preceding year. Moreover, during the years in which the Northwestern Pacific improved its record, the reverse was true as to the State of California as a whole.

A further benefit has been in the opportunity that the campaign has given for improving relations with the public. Each letter has indicated the road's interest in one of its patrons or potential patrons, while the public talks and other features have shown that the road's interest in the communities is not merely in securing all the transportation business it can get, but extends to the welfare of the citizens as well.

Purchases and Stores Convention Was Well Attended

*Seventeen committee reports and ten papers and addresses
fully occupied time of three-day meeting at Chicago*

NEARLY 500 members and guests of Division VI, Purchases and Stores, of the American Railway Association, were present in the Red Lacquer room of the Palmer House at Chicago on Tuesday morning of this week when D. C. Curtis, chief purchasing officer of the Chicago, Milwaukee & St. Paul, opened the eighth annual meeting of the Division. With reports to be heard from 17 standing committees in addition to 10 addresses and personal papers, most of which were concerned with various problems and technical details of

McKelligon Next Chairman

As a result of the election on Thursday morning the following officers were selected for the ensuing year: Chairman, A. S. Kelligon, general storekeeper, Southern Pacific, Pacific System, San Francisco; vice-chairman, C. C. Kyle, purchasing agent, Northern Pacific, St. Paul; secretary, W. J. Farrell, re-elected.

W. G. Besler, chairman of the board of the Central of New Jersey, represented the American Railway Association in the capacity of vice-president and addressed the



A. S. McKelligon



D. C. Curtis



W. J. Farrell

the purchase, storing and distribution of railway materials and supplies, the program was a full one, and occupied all the available time of two sessions on Tuesday and Wednesday and also a morning session on Thursday.

However, a carefully arranged schedule under which all items on the program were definitely timed, proved of great help in carrying out the entire plan for the three-day meeting.

meeting on Tuesday morning, presenting some illuminating statistics on the volume of railway purchases by way of driving home the tremendous responsibility of the officers in charge of the service of supply. John M. Glenn, secretary of the Illinois Manufacturers' Association, delivered an address on the interest of the shipper in the outcome of railway wage controversies and Samuel O. Dunn, editor of the *Railway Age*, presented a paper on the storekeeper as a merchant and his influence on the



W. Davidson



O. Nelson



W. A. Hopkins



H. C. Stevens



C. C. Kyle



G. E. Scott



C. B. Tobey



L. Lavoie



C. E. Walsh

Members of the
General Committee,
Division VI,
Purchases and Stores,
A. R. A.



J. F. Marshall



J. L. Woods



A. W. Munster



C. D. Young

economy of railway transportation. The feature of the convention was the special attention given to the budgeting of purchases and the development of greater uniformity in methods of accounting for materials and sup-

plies which may be purchased, and then carried and consumed.

The reports and addresses presented before the convention are abstracted below.

Some Observations of a Half Century's Service

By J. H. Waterman

Superintendent Timber Preservation, Chicago, Burlington & Quincy, Galesburg, Ill.



J. H. Waterman

My text is: "I have fought a good fight." This, as you know, refers to Paul, the great apostle. If he could say at the end of the road that he had fought a good fight, then there is something about fighting that we want to investigate. What Paul meant was that whatever he did, he did with his whole heart, his highest skill, and with all the power that was in him.

You may be surprised that I use the word "fight," but to me there is no word more appropriate. Paul was one of the great apostles and what he did he did with courage and, as he explains, he accomplished by fighting. I believe that we are expected to fill the positions which we hold to the best of our ability and, figuratively speaking, to be always ready to fight for that which is right.

Young men, if you want to succeed in the stores department you must become a good fighter. Know what you want, go after it, and stay with it until you get it! No railroad man of today is a success unless he is a gentleman. The day is past when he can be a leader in "painting the town red." A gentleman is a man who practices kindness and courtesy at all times, in all places and under all circumstances.

The other day I was riding on one of the railroads in the great West. The flagman was on the observation platform. A woman of middle age came out. He immediately picked up a folding chair and placed it so she could sit down. The next person to come out was a man, and he did the same for him. He did this in a quiet and gentlemanly way but everyone noticed it. Such courtesies bring traffic to our railroads. So let me emphasize the importance of being a gentleman.

Another qualification I would suggest is that you be a close observer, see things, keep your eyes open. When you move around, either in the store department or elsewhere, be careful to observe what is going on. I have known men in the store department who would fall over

a pile of rubbish—they never can win. Unless you have good eyes and use them, you will never be a success as a storekeeper.

Cultivate the habit of persistence. Note that I have used the word cultivate because you can cultivate it. Never let up, never quit, and never admit that you are tired even when you are; go after a thing as though you intended to win.

Common sense is a quality that not everyone is born with, but it is a very necessary qualification to have. It keeps men out of trouble; it helps bridge over hard places; it smooths rough places. A man without common sense is always getting into trouble. As I stated, a man may not be born with it, but I think it, too, can be cultivated.

I received this message on October 20, 1908:

"Your message yesterday evening reached me in time to inform the vice-president and general manager of the loading of the rail at Lincoln. I congratulate you on carrying out the vice-president's order in the loading of this rail promptly and satisfactorily. (Signed) T. J. Frier, general storekeeper."

You may wonder why I am introducing this message at this time. Note the date, October 20, 1908, yet I have kept the message. I prize it as one of the most valuable messages or letters I have ever received. Why? It was sent by the general storekeeper to me as storekeeper at Lincoln, Neb. He complimented me on my work. I walked around on my toes for a week after I got it and have always felt that there was nothing that this man could ask of me that I would not go out of my way to do.

Gentlemen, the young men working under you are human and they like praise if they have earned it. Criticism may be necessary at times and there is no doubt but that proper criticism helps build up the young men but you should never criticize unless you can suggest a better way to do the work. So if you want to make the younger men give you the best service that is in them compliment them when they have done good work.

I wish to express my appreciation of this opportunity to address you, and I hope when the time comes for us to leave this life of service, it may be said of all of us, "He fought a good fight."

Address of Chairman Curtis

It is and always has been a pleasure and an inspiration to attend the meetings of Section VI, and to have personal contact with the members who order, buy, receive house and distribute to the users, \$1,700,000,000 worth of material a year. The members of this organization are responsible for material necessary for the repair, maintenance and protection of 75,000 locomotives, 2,653,000 freight cars, 62,900 passenger cars, 500 rail motor cars, thousands of signals, numberless materials for track work, buildings and bridges, and the necessary supplies for the feeding, comfort and care of millions of patrons scattered over 275,000 miles of railroad. These

materials are represented in practically every line of manufacturing and production in the commercial world. There is an investment in stocks of material at all times of approximately \$575,000,000 and it is all for the care and comfort of our patrons, and the expeditious handling of their freight.

Your members have worked up rules and systems that have reduced the investment in material by hundreds of millions of dollars, and have reduced the amounts purchased by a larger amount. They have not only improved the purchasing, ordering, housing and distributing of material, but have been instrumental in bringing

about a more harmonious and co-operative feeling with the public whom we serve.

This section has worked in harmony and co-operated with the different branches of the government and other commercial agencies, bringing about a uniform scrap classification for the selling of all materials for which we have no further use; has adopted and helped co-ordinate the commercial grades of lumber, thereby aiding in conservation; has been very active in the development of the different treatments of lumber thus aiding in the preservation of our fast diminishing supply of wood; and has also been active in advancing the cause of standardization and simplification sponsored by Secretary of Commerce Hoover. This has not been of benefit to ourselves alone, but has been of service to all other agencies of commercial activity.

Much Work for the Section to Do

When it is realized that we order, purchase, house and distribute 25 per cent of the steel manufactured in this country, 25 per cent of the lumber used, 22 per cent of the total coal mined, and like proportions of numberless other items, it is not hard to understand the necessity for extensive studies, experimentation and practical application of the theories advocated in systems, rules, classifications and records to control properly our complex problems for ordering, purchasing and housing, to say nothing of the necessity for furnishing the materials that will produce the service required in giving adequate transportation for passengers and commodities used in all parts of the country.

Not one man, nor a few men, conceive and work out the tremendous problems involved in our complex organization. It is through this organization, through contributions of the thousands of employees and officers, as the result of their research, hard work, application, discussion, experimentation and committee activity that efficiency has been attained, and that our present standards were evolved.

However, it is necessary that we continue in the future as in the past. There is much work to be done in improving and refining our present policies. There is need for new methods and policies. We are continually adding new devices, such as motor cars, radio, buses and truck service with the resultant problems of repair parts, purchases, housing and distribution and we must expect constantly changing conditions. The committee work and the work of individuals will be greater and more complex as the years come.

Opportunities for Reducing Costs

Much can be done towards reducing the costs of handling materials from the time they are received until actually delivered to the user. Handling of material adds to its cost, but not to its value, and probably we can find no greater opportunity for savings than by giving this problem persistent and consistent thought during the coming year. The ratio of common labor to the total population decreased 2.2 per cent in 1925, and this constant decrease in available labor is forcing a change in our handling methods.

There is great need for improvement in our cost-keeping methods. The manufacturers of many commodities used on our railroads are constantly and forcibly calling to our attention the fact that, in attempting to manufacture materials in our own shops, we are deceiving ourselves in many cases, as our cost-keeping methods are not taking into account all the cost factors. We must find means of knowing whether it is costing us more to manufacture material ourselves than we can purchase it for from specialty manufacturers. We must also

know the effect on the manufacturers who develop the commodities used in transportation, as transportation is the only thing we have to sell and upon it our success or failure depends.

Get Closer to the Supply Man

We also need to develop a closer contact with the people supplying our needs. Outside agencies have developed practically all the inventions, labor-saving devices and other appliances used by the railways for economical and improved operation. It therefore follows that if we are able to effect a better understanding with those supplying our needs, we will have better co-operation. The majority of the manufacturers with whom railroads deal are satisfied with a reasonable profit on their products. Anything we may do to help them reduce the cost of their production is reflected in our own costs. We must take time to learn their problems and to help them solve them, as they also take time to know our problems and help us solve them.

There is need for a continuation of the policy of ordering material subject to specification, and the enlargement of testing laboratories to see that the articles purchased come up to requirements of this specification. The United States government shows a saving of a billion dollars a year at a cost of \$2,000,000, by preparing specifications for government purchases and by insisting on tests to make sure that the material purchased comes up to its specifications. The railways have, of course, been working along these lines for years, but it requires constant watching and improved methods to keep abreast of the improvements in the materials which are purchased.

We must develop statistics to know that we are not carrying excess material for even a short period. We have been very clearly told the cost of carrying materials on our railroads. We must also show not only the heads of the various departments, but also the bridge, the car and the roundhouse foremen and the roadmaster the savings that are possible in the economical use of material, as well as those that accrue by not spending money in advance of the time that the material is actually needed for use.

More Care in Ordering Materials

There has been much agitation in regard to the policy of hand-to-mouth purchasing. The railroads probably were the pioneers in this policy. This involves not only the question of educating and systematizing the store and purchasing departments, but also the big problem in systematizing the ordering of material by the user, so that the receipt of the material may be co-ordinated with the needs of his labor forces. Special appliances for locomotives are often ordered, purchased and delivered two and three months before they are applied; material is ordered out for signal work too far in advance of the needs of the gang; bridge material is sometimes ordered too far in advance of its use. In some instances material intended for additions and betterments may be delivered in advance of the time it can be used, because falling revenues have required the curtailment of the labor forces.

It will require an active campaign to bring these facts to the attention of the users in such a way that reduction in inventory will be accomplished. The Purchasing and Stores section is also interested in reducing the inventory as much as possible for savings on taxes. Taxes have increased steadily every year since 1921; taxes for the first nine months of 1926 were 21 per cent greater than the corresponding average for the previous five years, and nearly 40 per cent greater than in 1921. The prac-

tices recommended by this section have reduced the inventories for Class I railroads in the United States in 1920 from a total of \$755,563,278 to \$525,853,107 in 1925.

New Problems to Be Solved

The current buying, or buying for immediate needs, forces simplification and standardization, for if materials are to be delivered quickly they must not require special processes for their manufacture. However, there is another side to this question. The cost of producing increased one-fifth in 50 years, but the cost of preparing and selling has increased three times. In 1870, 10 per cent of the workers in the United States were engaged in the process of distribution, while in 1920 the percentage had risen to 25 per cent, most of this increase being with the wholesalers and retailers. There is need for a study of the problem to find out which is the cheaper and better method, hand-to-mouth buying with its increased cost of distribution, or a large inventory with its excessive carrying costs.

There is a great need of a factor that will show the

relation of work done, as measured by freight train miles and passenger car miles, or revenue received, as indicated by operating revenues, to the amount of money which should be available for the purchase of material. We have made much progress in the budget and allotment plans, but these systems still require development.

To the older members goes the responsibility of giving inspiration, direction and knowledge to the younger members in preparing for the tasks that are before them. For the younger members, there are all the multitudinous problems that are going to cause you long days of toil and nights devoid of ease. It is going to require a high degree of training, intelligent co-ordination, co-operation, sacrifice and years of close application and hard work. It has been said that genius is 95 per cent hard work and 5 per cent intelligence and inspiration, and to you young members I wish to say that hard work is your best friend. There is nothing that will develop your intelligence, your health, your vitality and your strength more effectively than hard work, and the greatest blessing that can be bestowed upon you is a liking and a necessity for hard work.

Address of W. G. Besler



W. G. Besler

The railroads of this country are one of the principal contributors to our national prosperity. Purchases of fuel, materials and supplies by the railroads of this country in 1926 alone amounted to \$1,559,032,331. This was the greatest amount ever spent for that purpose by the railroads of the United States in any one year on record with the exception of 1923.

The railroads are one of the controlling factors in the economic welfare of the nation. Not only with regard to a number of important commodities are they among the largest purchasers, but they also render a vital service to the public in the form of transportation. At the same time they distribute nearly three billion dollars a year in the form of wages which are largely paid out by railroad employees in purchasing the products of industry.

Replies just received by the Bureau of Railway Economics to a questionnaire sent to all railroads for the purpose of ascertaining the amount of purchases made by the carriers during the past year show that the rail carriers fully maintained in 1926 their record as large purchasers of fuel, forest products, iron and steel articles and other items, thereby substantially contributing to the national prosperity. This was incident to moving in that year the largest tonnage ever handled by them in any one year on record.

The total of \$1,559,032,331 in the amount of fuel, materials and supplies purchased by the railroads in 1926, was an increase of \$166,989,000 compared with the total purchases in 1925 and an increase of \$215,977,000, compared with 1924. It was, however, a decrease of \$179,671,000 compared with 1923.

Expenditures of the railroads in 1926 for coal and other fuel for the first time failed to hold first place as has been the case in previous years. Instead, expenditures for iron and steel products went into the lead, amounting to \$507,302,186, the greatest sum ever spent

in any one year for those products. Ranking second was fuel to the amount of \$473,353,928. While this was somewhat larger than in 1924 and 1925, it was a reduction of \$144,446,000 under the fuel bill for 1923, in which year the railroads bought 154,902,000 tons of bituminous coal compared with 140,083,885 tons in 1926, although the railroads in 1926 carried nearly 7 per cent greater freight traffic than they did in 1923. This indicates a material increase in fuel efficiency during 1926.

Purchases of steel rails in 1926 amounted to 2,503,991 gross tons at a cost of \$111,000,000. This is the greatest tonnage of steel rails that has been purchased by the railroads in any one year.

The railroads also purchased 93,759,913 cross ties at a cost of \$101,000,000. This was an increase of approximately six million ties compared with last year, but a decrease under the two previous years. Including not only cross ties, but switch and bridge ties, as well as other timber and lumber, expenditures of \$186,291,234 were made for forest products during the past year by the railroads, which amount exceeded the corresponding expenditures for 1924 and 1925.

These statistics of rail purchases cover only those items that are bought and paid for directly by railroad companies. In addition, they are indirect purchasers of many commodities, large quantities of which go into railway equipment and into new construction work that is contracted for in lump sum agreements and is not classified under the head of materials purchased directly.

That the railroads are an important factor in the industrial life of the nation is shown by the fact that in 1926 they bought about 22 per cent of the total coal output of the United States and some 20 per cent of the fuel oil production. They also took about 15 per cent of the total annual lumber and timber cut in the United States while their direct and indirect consumption was close to 25 per cent. In addition, railroad purchases accounted directly and indirectly for a quarter of the total iron and steel output of the country.

Reports show that the rail carriers also bought 3,126,500 barrels of cement in 1926 and 25,421,831 cubic yards of ballast, purchases of both items during the past year having exceeded any previous year on record.

Report of Committee on Forest Products



O. A. Schultz
Chairman

Division V is engaged in harmonizing American lumber standard sizes and workings with the requirements of car design, and conclusions are expected to be reached at its annual meeting this year. This work will provide up-to-date standards for car lumber.

Railroads generally make use of American lumber standards in their purchases of lumber for building construction. To do otherwise means the purchase of special sizes at advanced prices. It is recommended that the tabulation of revised American standard lumber sizes be adopted.

Inspection of Lumber

Investigation develops a varied practice of inspecting forest products by the railroads. There are numerous advantages to be derived by the railroads from inspection at the mills or points of origin, as against destination inspection.

If lumber is inspected at destination points, it has been the experience of most railroads that controversies over grades, loading and rejections have been met with, which have proven of no benefit to the receiving company. Mill inspection will also eliminate use of valuable space at shop points, which would have to be used for rejected lumber.

It is also felt that mill inspection guarantees close compliance with the terms of the orders, as there is a marked tendency on the part of many inspectors to accept short and over loads, if the material is on hand at destination. Mill inspection also eliminates the possibility of using rejected material that might possibly reach the shops, and the possibility of the shipper assuming that he can ship inferior grades of lumber. The cost of mill inspection properly handled should not be much higher than destination inspection, and the railroads should be able to show a saving by mill inspection, in preventing the shipment of lumber which may possibly be rejected.

Mill inspection will have a tendency to permit the purchase of lumber at lower prices than destination inspection, for the reason that when mill inspection is secured and shipment is made, the shipper knows definitely that he will be paid for the quantity of lumber as accepted by the inspector. Many mills are willing to make lower prices where mill inspection is followed, thereby increasing the purchasing power.

The committee recommends that where railroads buy small quantities of lumber in locations where they are not justified in maintaining inspectors, that two or more railroads pool their inspection corps and get the same result as one large purchaser.

The committee further finds that certain railroads, operating in the producing centers and who maintain their own inspection organization, are and have for some time past been handling the inspection work for other railroads located at a considerable distance from the point of shipment of forest products. This arrangement has worked out quite satisfactorily and the committee feels there is an opportunity for other railroads to co-operate along these lines.

Purchase and Delivery

The desirability of low inventory of yard stocks on lumber is of vital importance to all railroads. It is the opinion of this committee that this can best be accomplished by placing orders every 30 days with specified dates for delivery. This permits the storekeeper to maintain his stock on a more even basis with low stock and at the same time permits the purchasing agent to place his orders with greater regularity, maintaining a better price while avoiding the flooding of mills with large orders, resulting in price increases. This method of purchasing will effect an annual saving of from 10 to 25 per cent on excess stock, covering handling and carrying cost.

This plan has worked successfully, but it cannot be done without close co-operation between the purchasing, store and using departments.

Treated Car Material

There is a pronounced move on the part of mechanical and car construction engineers to develop means for pre-

venting decay of lumber used in car construction and maintenance. The use of treated lumber for freight cars is increasing. When treated lumber is adopted, handling becomes a store department subject. This involves the seasoning of lumber before treatment and storage after treatment.

Those railroads which have adopted the practice, are generally installing small pressure cylinders for treating small quantities at the repair tracks. Regardless of the method of treatment adopted, the committee recommends treatment in such quantities only as are necessary to meet current requirements. On account of their inflammable nature, the chemicals should be stored in such a manner as not to endanger other classes of lumber or property. It is advisable to have a representative of the purchasing department, who is a competent lumberman, confer in making up specifications.

There is an opportunity for the elimination of stock sizes and dimensions of lumber carried in railway store stocks and the subject should receive considerable study by a joint committee composed of representatives of purchasing and using departments.

Car oak can best be preserved from splitting and heavy checking during the seasoning period by painting the ends with a heavy paint having a sufficient asphaltic base to form a filament over the ends to avoid the quick evaporation of the moisture. Where common oil paints are used, little value, if any, has been obtained.

During the year the committee visited several of the large lumber mills in the northwest.

Committee: O. A. Schultz (chairman), chief lumber inspector, C. B. & Q.; A. T. Babcock, tie and timber agent,



In the Douglas Fir Woods

W. M.; H. O. Bush, general lumber and tie inspector, Erie; T. H. Clarke, tie and timber agent, Sou.; T. B. Harris, assistant purchasing agent, C. N.; D. R. Elmore, assistant to general manager, Fruit Growers Express; W. A. Knight, chief lumber inspector, I. C.; J. H. Lauderdale, general purchasing agent, Gulf Coast lines; J. G. McGreener, general tie and timber inspector, A. T. & S. F.; Paul McKay, assistant purchasing agent, N. P.; W. W. Morris, assistant to general purchasing agent, Penna.; E. H. Polk, district storekeeper, S. P.; W. C. Weldon, purchasing agent, C. & S.; J. F. Marshall (chairman ex-officio), purchasing agent, C. & A.

Discussion

O. A. Schultz (C. B. & Q.), chairman: The committee calls attention to the fact that this recommendation on the application of the American Lumber Standards deals with the yard stocks and does not apply to car lumber. Railroads are generally going to the practice of yard inspection more and more each year and the committee feels, after considering all angles of the purchasing and inspecting of lumber, that mill inspection is the

best way of purchasing forest products. With reference to the purchase and delivery of lumber to provide low inventory, the committee believes that the best results can be obtained by timely requisitions on the purchasing agent and adhering to specified dates for delivery. If the recommendation concerning the preparation of specifications is carried out a saving will be effected by purchasing grades of forest products better known to the lumber trade, which will enable them to give quotations on grades with which they are familiar.

[At this point the question of the preservative treatment of car lumber was brought up from the floor and several questions were asked about the practices in this regard.]

Mr. Schultz: The report treats only of the painting of the ends, while seasoning, to avoid weather checking and splitting the ends, and has no bearing on the preserving of the lumber.

[The discussion on the treatment of car lumber persisted, however, and it was brought out that two roads are using pressure treatment for wooden sills, decking of open top cars, stock cars and milk cars, with a retention of six and seven pounds of creosote respectively. The remaining roads mentioned are either dipping the lumber in creosote immediately before use or are applying a surface coat of creosote by means of a spraying machine. At the request of the chairman and Mr. Schultz, Paul McKay (N. P.), told of the meeting of the committee at Seattle, and described an inspection trip to a number of saw mills in the Northwest.]

C. D. Baldwin (B. & Ar.): I would like to ask the committee about the clause: "This method of purchasing will effect an annual saving of from 10 to 25 per cent on excess stock, covering handling and carrying cost." I can understand the 10 per cent but what authority is there for saying that it would cost 25 per cent to carry an excess quantity of lumber for a reasonable length of time.

Mr. Schultz: Deterioration and obsolescence would enter into that, but there is no definite information on the subject.

O. Nelson (U. P.): I believe the percentage quoted in this report is excessive.

E. H. Polk (S. P.): The committee found that some railroads considered it was necessary to carry as high as a year and a half's stock of lumber. From the experience of some of the members present, it was found that in ordering as recommended, the stock investment in lumber had been reduced from 50 to 75 per cent. I be-

lieve, however, that the figure should be substantiated although we have nothing definite in our files whereby we can do so. Our thought was to have a steady flow of lumber coming in all the time instead of placing the orders for large stocks of lumber at infrequent intervals, thereby helping out our yard stock and at the same time enabling us to obtain a better price.

Mr. Baldwin: I am not opposed to deliveries at specified times. It is an excellent idea, but 25 per cent is a little exaggerated.

J. W. Gerber (Sou.): If lumber is ordered according to standard sizes there is no obsolescence and you can generally afford to carry a three, four, five or six months' stock of lumber.

Paul McKay (N. P.): If lumber is bought too far in advance, the price may be high and in a very short time the price may drop, in which case the loss would be much greater than 25 per cent.

Mr. Baldwin: I take exception to the statement that "it is generally agreed that the cost of carrying material is 25 per cent." That is excessive. Mr. Hall placed the figure at 15 per cent a year or two ago.

Mr. Polk: There is no class of material on which the handling cost is greater than it is on lumber, and regardless of whether we buy by standard sizes there is a certain loss, sometimes heavy, through warping, twisting or other causes and I believe if 18 per cent is a fair percentage to use for other classes of material, 25 per cent is a very fair percentage to use on lumber.

F. D. Reed (C. R. I. & P.): There is no necessity of ordering lumber farther in advance than 30 to 60 days, except lumber that is to be seasoned for treatment. Giving lumber a bath of thin creosote is more or less of a joke. If you are going to accomplish anything in the way of deferring decay, you must give a pressure treatment and retain the creosote in the wood. It is not feasible to treat much lumber except open and stock car flooring. We do not treat any car lumber as yet but we propose to creosote stock car flooring by a process which will result in honest-to-goodness treatment. Many of us are carrying lower stocks of lumber than formerly, because most cars are made of steel and the demands for lumber are less than they used to be.

Mr. Polk: The committee particularly brings out the fact that treating lumber is an engineering subject and we deal alone with the handling of the treated lumber.

[A motion to accept the committee's report was carried.]

Report on Control of Shop Orders



W. M. Hinkey

The general storekeeper should assume the same responsibility for shop manufactured material as the purchasing agent assumes for material purchased. The storekeeper must issue all shop orders, and the quantities prescribed should be an absolute function of the supply department, based on manufacturing facilities, since this department is responsible for the requirement of shop manufactured material to the user at all points on the railroad as well as the investment of unapplied materials on hand.

Shop orders should be issued once a month where it is practicable to do so, this to enable the shops to schedule work. Information for preparing shop orders should be obtained from stock record, based on average consumption, except where conditions are changing and the storekeeper has information that there will be an increase or decrease in requirements.

Cost of Setting Up Machines

The cost of carrying charges on railroad materials ranges from 15 to 20 per cent, and although the percentage is less for such materials as are handled on shop orders, the carrying charge is of first consideration. In some cases, the cost of setting up a machine should be considered, together with the cost of the carrying charge.

An example is given of the operation of a Class I railroad automatic machine shop, where the cost of setting up the machine is charged to an individual shop order and prorated over all shop orders worked in the shop during the month:

Value of material manufactured	\$20,666.96
Number of machines working on shop orders	38
Average number of shop orders worked per month	181
Cost of setting up machines	\$192.65
Per cent added to material for cost of setting up Machine .....	.00932

The formula used by one railroad is as follows:

$$X = \frac{C}{A \times D \times \frac{B}{12}}$$

A—Value per unit.
B—Carrying charge per year (12 per cent used.)
C—Cost of setting up machine or machines.
D—Months' consumption based on past records.
X—Quantity to be ordered on shop order in terms of months' supply.

Example:
1 1/4 x 7 11/16 " Guide Bolts;

$$\begin{array}{l} A-418 \text{ ea.} \\ B-12\% \\ C-.927 \\ D-6 \end{array} \quad \begin{array}{r} .927 \\ \hline .12 \\ 418 \times 6 \times \frac{.12}{12} \end{array} = 36.9 = 6 \text{ mo.}$$

79-H-14—Cab Turret Bonnet

$$\begin{array}{l} A-1.817 \text{ ea.} \\ B-12\% \\ C-.90 \\ D-5 \end{array} \quad \begin{array}{r} .90 \\ \hline .12 \\ 1.817 \times 5 \times \frac{.12}{12} \end{array} = 9.9 = 3 \text{ mo.}$$

Delivery of Material

All material ordered should be delivered to storekeeper and receipted shop order credit slip signed by the storekeeper for the quantity received. Should it be necessary for material to be taken from machine or shop, charge slip or hand-to-bearer order should be given the operator and each day this hand-to-bearer order should be turned in to the storekeeper with a proper shop order credit slip.

Careful consideration should be given to the delivery and price at which material could be purchased in the open market.

To avoid delays in completing shop orders the storekeeper should know that sufficient raw material is on hand or arranged for, before placing them, he should know that the proper description has been given and that correct blue print reference has been shown, and make regular check of open shop orders to insure delivery.

Committee: W. M. Hinkey, (chairman), district storekeeper, B. & O.; C. A. G. Blomquist, stores accountant, C. of G.; A. W. Blume, general storekeeper, St. L.-S. F.; E. R. Brinton, assistant general storekeeper, C. U. O.; W. L. Oswalt, assistant general storekeeper, Penn.; J. T. Kelly, general storekeeper, C. M. & St. P.; W. S. Riach, chief clerk to general storekeeper, A. T. & S. T.; L. C. Thomson, manager of stores, C. N.; F. C. Turner, traveling storekeeper, N. P.; A. W. Munster, (chairman ex-officio), purchasing agent, B. & M.

Discussion

A. W. Munster (B. & M.): Some explanation can be given to the formulæ in the report. A storekeeper who was manufacturing for the whole system, in an endeavor to get a good turnover, was putting in shop orders as nearly monthly as he could get them. As a result, a large number of shop orders were going through for small quantities. This not only increased the cost on account of setting up the machines, but it delayed the shop order program. When the matter was taken up by the mechanical superintendent, we told him that the cost of carrying material was 12 to 15 per cent. But on being informed of the effect on the shop operation, we agreed that where the carrying charge of the material equalized the cost of setting up the machine, we would use that as a basis for the number of months' supplies to order. I do not think this arrangement would have been possible, however, if we had not had a complete piece-work schedule so we knew the absolute cost of setting up every machine for every job.

E. H. Polk (S. P.): Those roads using the unit pricing system are able to manufacture in bulk and get away from the machine set-up.

Chairman Curtis: What effort is made to compare the cost of manufactured material with purchased material? Another question is that of patented articles that are being manufactured in railway shops. Have you releases on them, and do you know you are manufacturing anything upon which there is not a release?

Mr. Baldwin (B. A. R.): We found, in a few instances, that we were making material in our shops which cost us much more than it cost in the open market. Wherever we find we can buy cheaper we do so.

Chairman Curtis: What do you include in the costs, Mr. Baldwin?

E. W. Peterson (B. A. R.): In arriving at costs we take the value of the material, plus the labor with the usual shop expense and store expense, which includes overhead.

Chairman Curtis: Does the auditor clear the building repairs through that manufacturing account?

Mr. Peterson: That is an accounting feature I do not know anything about. I presume he does.

Mr. Munster: In working up the ordinary shop orders all we show is direct labor and direct material costs, but in making comparisons as to whether the article can be bought to advantage outside, we add 100 per cent for overhead.

H. C. Stevens (Wabash): After a check, purchase was resorted to, if the article could be purchased more cheaply than it could be manufactured in the shop. Would it not be well to purchase unless we are certain we can make it more cheaply than we can buy? We fool ourselves on shop cost. What we are buying is well controlled by the market on the outside.

G. A. Goerner (C. B. & Q.): We check to determine whether it is costing us more to purchase the material than it does to manufacture. The vice-president has appointed a storekeeper as shop cost accountant to follow up matters of this kind.

Chairman Curtis: This is an important item and needs to be followed up. Are there any other railroads that have any other systems?

G. Hunter (A. T. & S. F.): Before making a store order the purchasing agent should be consulted to see at what price he can purchase the article before starting manufacture.

J. T. Kelly (C. M. & St. P.): We try to determine what it costs to manufacture the articles, yet I sometimes think that we should buy instead of manufacture. A piece of brass may have a blow hole in it. The operator, finding it defective, may throw it into the scrap box, pick up a new piece and charge it to the order. A double charge results and the cost will run up. We made a check on bolts a short time ago, and we are still doubtful whether we can make them cheaper than we can buy them. If a \$10,000 machine is used, the interest on the investment means something. I do not believe any of us are getting the right charges on our store orders.

Mr. Peterson: In connection with the question the chairman brought up about repairing roofs, that is known as Account 235 and would not come under shop expense.

Chairman Curtis: The thing I was trying to bring out was the overhead. Mr. Munster seems to be the only man so far who has covered the overhead. He has added 100 per cent arbitrarily.

Mr. Munster: I doubt if that covers it.

Chairman Curtis: I agree with you.

J. U. King (A. C. L.): It sometimes happens that a

road is situated far from the source of supply. We are far from the steel district. Therefore we have a foundry and find it very convenient.

C. B. Tobey (L. V.): We had a question whether we would purchase the cab curtain requirements for the season from an outside manufacture or make them up ourselves. In figuring the cost of doing the work in our shops plus the overhead charge of about 50 per cent, we found that we could have the work done cheaper outside, but eliminating the shop overhead cost we could do it cheaper in our own shops; consequently we did it in our own shops because the overhead was there whether we did the job or not.

E. D. Toye (C. N.): We have a rolling mill, and after investigation we found that we could not compete with the outside manufacturers. To reopen that mill entailed a complete and separate organization, whereas if we permitted manufacturing of bolts and other commodities it would not tend to increase the shop organization, but it did add some labor problems.

Mr. Munster: I know on some jobs the cost of getting the dies and putting them in the hammers, together with the cost of setting up the machine alone made the articles cost \$1.50 apiece. This was not only a machine operation, but it also includes some blacksmith jobs.

[A motion to accept the report was carried.]

Report on the Budget Control of Material



R. C. Harris
Chairman

The committee proceeded with the investigation of this subject upon the assumption that any methods affording even a remote prospect of improving the service of supply or the stock balance, justify consideration. Since material is acquired in three ways, the committee gave consideration to the control which might be effected for each of the methods.

By Purchase: Quantities for future needs are usually based on past consumption records, scheduled output of cars and locomotives or program of shop and maintenance of way work. The record of past consumption, while

the best method thus far developed for material where a definite program is not available, will not always produce correct results for future operations, hence any reliable data which can be made available to check the quantities ordered from consumption records, will help in producing more nearly correct quantities. This data for checking can be made available in the relationship which has been found reasonably constant between the total maintenance expenses and the cost of the material entering into those expenses. It is that relationship which appears to make practicable the use of a budget to assist in the control of quantities purchased.

By manufacture: Quantities are determined by past consumption, shop schedules, capacity of manufacturing facilities, number of workers and the number of working hours. If the manufacture of material on any railroad at its own shops is an important source of its supply, it will be necessary to withdraw from general consideration such accounts as are chiefly influenced by manufacture and place those accounts on a separate budget for the control of manufacturing operations. The number of accounts, however, on any railroad is not large.

By Reclaim: Quantities procured are determined by the policies and practices of the maintenance of equipment and maintenance of way departments. These policies and practices are usually constant over long periods; therefore, the amount received into the stock from that source varies little from month to month. For this reason it is neither necessary nor advisable to place reclaim on a budget.

A budget in itself possesses no power to control the inflow of material. Whatever value it may hold will depend upon the thoroughness with which the necessary data is prepared, the accuracy with which that data is interpreted and upon the judgment exercised in administering the budget after it has been prepared. Any consideration of the merits of budgetary control must include a study of methods of preparation and administration before any sound conclusions can be drawn. Since the term budget is generally understood to cover expenditures for both labor and material, the committee believes that the phrase Allotment for Purchase would more accurately convey the idea to those who have not had experience with the plan.

Preparation of Data

Following is an outline of operations necessary before budgetary control can be made thoroughly effective:

Estimates of maintenance of way and maintenance of

equipment expenses for the period to be covered by the budget must first be prepared. Any inaccuracies in those estimates will be reflected in the materials budget, therefore it is necessary that they be prepared by the most expert authority available and revised whenever subsequent developments indicate substantial changes. The executives of many, if not most of the railroads of today, arrange for the preparation of such estimates.

The problem of preparing for a budget can be reduced to its simplest form by eliminating from the general consideration, such commodities as fuel, stationery, steel rail, cross and switch ties, ballast, chemicals for timber treatment and commissary supplies for dining cars and restaurants, and all A. F. E. expenditures which are subject to individual treatment because the consumption of those commodities is usually governed by policies not applying to general materials. The remaining commodities may be grouped as dependent upon either maintenance of way and structures expense or maintenance of equipment expense.

After this grouping has been effected, the following data should be maintained for each group by material accounts:

1. On hand values at end of month. Material for R. & E. projects should be shown separately.
2. Outstanding commitments at end of month.
3. Commitments made during the preceding month.
4. Received by purchase during the preceding month.
- *5. Received by manufacture during the preceding month.
6. Received by reclaim during the preceding month.
7. Consumed during the preceding month. Separated between maintenance and road and equipment.
- *8. Used in manufacture of other material during preceding month.

* Where the railroad manufactures many of the items used.

From this data is calculated the operating need for the period desired for comparison. This operating need is the value of material which should be acquired during the period in question to supply the needs of the railroad without increase or decrease in the value of the stock on hand and is a value which can be used when more accurate information is not available regarding policies for the period for which the budget is being prepared and affords a check on any other calculation made to determine the amount that should be spent during that period.

It is obvious that the value of the material consumed is not the value of material purchased. Reclaim and manufacture are factors which must be considered and so long as the policies of reclaim and manufacture remain constant it is safe to assume, for this purpose, that the values acquired by those processes are constant from month to month, or if desired, the variations from month to month may be determined by more extensive studies. There is then a total operating need and an operating need for purchase.

Following is a method for obtaining the operating need by purchase and the per cent of purchased material needed for specified maintenance of equipment expenditures:

Month	M. of E. Expenses	Received by Purchase	Inc. or Dec. in Material Balance	Oper. Need by Purchase	Percent of Oper. Need to M. of E. Expenditures
January ..	\$12,000,000	\$4,100,000	Dec. \$300,000	\$4,400,000	36.7%
***	*****	*****	*****	*****	*****
December..	13,000,000	4,900,000	Inc. 100,000	4,800,000	37.0%
Total for Year...	\$150,000,000	\$55,000,000	Dec. \$200,000	\$55,200,000	36.8%

After a percentage, such as is shown in the last column above, is obtained from existing data for a period which is representative, it may be applied to future M. of E. expense

budgets and a value obtained quickly which will represent the purchases necessary to supply an M. of E. expense budget. It will usually be found, however, that this percentage will vary somewhat according to seasons, and good judgment must be used in its application.

The maintenance of way operating need may be obtained in a similar manner except that frogs, switches and other track material will be influenced by the quantity of rail being laid, therefore the effect of rail laying upon those accounts must be given careful consideration in the light of past experience. This may be done by separating those accounts from the maintenance of way budget and considering them only in connection with the amount of rail to be laid.

Road and equipment expenditures involve definite projects for which reasonably accurate bills of material may be prepared; therefore, purchases of material for road and equipment projects must be eliminated from the budget for maintenance material. Likewise, charges from the material account must be separated between maintenance and road and equipment in order that values of material used in maintenance may be readily available.

Administration of Budget

The most difficult feature of the administration of a budget is the determination of a proper balance of units which can be purchased under a given allotment of money. It may be found frequently that the total quantities prepared on a consumption basis for a material account will exceed in value the budget allotment for that account. When such condition exists, the quantities must be reviewed in the light of the budget. That review will generally develop the reason for the discrepancy and it is that review that may save a substantial increase in the stock balance.

The general storekeeper is the officer having the records for the entire operation covered by the budget and he alone must make the final decision on quantities ordered. To what extent the preparation and administration of the budget can be passed to subordinate officers depends upon the local organization. The committee believes that the responsibilities for both the request for a budgeted amount and for the administration of the budget after being fixed, should be passed to subordinate as far as local organizations make such plan practicable.

A better control of material for A. F. E. projects is recognized as most important but the committee is not prepared to offer the budget as a solution of that problem because of the impracticability of obtaining advance information of projects to be authorized. The committee believes that the control of this class of material depends upon the censorship both as to quantity and time of delivery, placed upon the requisition before it is acted upon by the purchasing agent.

Conclusion

The preparation of a budget or an allotment for controlling purchases and manufacturing operations will assist in the control of material balances and tends to improve the service of supply for the following reasons:

(a) It will encourage co-operation between the purchasing and stores departments and the using departments.

(b) A closer check on quantities ordered is forced by having a total money value for each class of material, which if exceeded will certainly cause an increase in the material balance. This checking operation furnishes advance information as to how the material balance will be effected.

(c) If a definite reduction in the material balance is decided upon as necessary, the budget furnishes a method for accomplishing this reduction in a systematic manner.

(d) It brings storekeeping practice a step nearer a science by making use of known facts as guides for future action.

Committee: R. C. Harris, (chairman), general storekeeper, Penn.; C. D. Baldwin, purchasing agent, Bangor; J. J. Bennett, purchasing agent, I. C.; M. J. Collins, general purchasing agent, A. T. & S. F.; E. D. Toye, general storekeeper, C. N.; J. U. King, assistant general storekeeper, A. C. L.; F. W. Mahl, general purchasing agent, S. P.; J. V. Miller, assistant general storekeeper, C. M. & St. P.; C. K. Reasor, assistant manager of stores, Erie; C. L. Wright, general storekeeper, M-K-T; W. A. Hopkins (chairman ex-officio), general purchasing agent, M. P.

Discussion

R. C. Harris, (Penna.), chairman: The committee does not advocate substitution of budget control for existing methods which are satisfactory, in as far as they go, but the problem is becoming more complex, and

additional methods seem to be necessary. We favor budget control to supplement the store book control and not supersede it. The need for a budget and the control of both purchasing and manufacturing of material is discussed in the report. Since these two sources of supply are the chief ones by which material is obtained, it is thought advisable that both be controlled by budget. The committee found no real opposition, but some of the members felt that all of the practices might not be subject to universal use.

Mr. Baldwin (B. A. R.): I attended the meeting of the committee that prepared this paper. I was sympathetic with it and helped as much as I could. Consulted our general storekeeper, and had the benefit of suggestions made by other general storekeepers and purchasing agents, but finally we did not recommend its adoption to our own road. We use the stock book and are getting the same results that this report proposed to give. During the last three years we have reduced our stock 38.7 per cent by the method. However, I can see where other roads might use the budget to advantage so I recommend it to such roads.

[At this point J. V. Miller, assistant general storekeeper C. M. & St. P., explained in detail the budget system as outlined in the report and gave reasons for the recommendations included in the report.]

U. K. Hall (U. P.): Mr. Miller truly said that if we want to reduce stocks we cannot depend on the stock books. The stock book is absolutely the foundation of the store department structure and must be accurate. We must use the consumption that is shown in the stock book, what we used a year ago and what we are using now. This shows how the material is moving, what the financial trend is, what our roads expect to do, and from this data we build up our orders. We can budget our new work. When it comes to maintenance materials if the falling expenditures are reduced and we must control our stock by securing advice from our management as to conditions and then go back to our stock books in order to do so. I believe we can control the stock situation without the budget.

Mr. Miller: Did you understand me to mean that the stock books were secondary to the budget?

Mr. Hall: That was the impression.

Mr. Miller: That was not what I meant. The stock books will give you information as to the definite amount to order. If your finances are not in shape to order that amount, then you must consult the user, tell him how much money you have, and ask him which are the most important items. The budget is secondary to the stock book.

Mr. Hall: But the user might consider that his track work is the most important thing. The chief engineer might say something on another division, the bridge or certain equipment is more important and there the budget would not work. We have to spend the available money for the most important work irrespective of what is called for in the budget.

Chairman Curtis: How is the stock book going to control that?

Mr. Hall: The stock book would not control such a situation any more than the budget.

W. Davidson (I. C.): The budget system is a success if it is operated as it should be. We have derived gratifying results from its use. I have been able to master our stock balances with \$200,000 or \$300,000 on a \$15,000,000 stock in any one month, and before we put the budget system into effect our stock ran up and down and the only way we were able to effect any control was to arbitrarily curtail purchases. This system hurt the material using departments. During the past three years

our stocks have been running in a straight line. So have our purchases. These results are obtained absolutely from the budget.

Mr. Miller: Our chief carpenters have work sheets showing what they intend to do. Our master mechanics have work reports on the number of engines

of every class they intend to repair. It is the same with the other departments. There are times when work is curtailed unexpectedly and then there is a surplus stock for a time. We shut off on our output, but we get notice in time we cut the allotment.

[A motion to accept the report was carried.]

Education on the Value of Supplies

By A. L. Hayden

Traveling Storekeeper, Southern Pacific, Houston, Texas

There can be no better way of educating using departments to the value of material than to have those values attached or appearing on the material when it comes to the individual ordering or using it. To date, however, the surface of this new development has hardly been scratched. Unit piling came to us and after many experiments has been brought down to a practical method now generally approved.

In furthering that work, indicating prices on material is growing in favor. The result of these two pave the way by educating using departments to individual values of materials, as, for illustration, on the larger articles, storekeepers stencil or otherwise affix the actual price, which goes with the material to the user. Of course, on the numerous small items it is neither practicable nor feasible to show the price on or attached to the material when it is issued and this, I think, gives suggestion for further study to develop the best means of causing these prices to come before the users. We know from experience that mechanics have been known to set aside new material by reason of the price appearing on it and have arranged to use discarded material after repairs have been made. It is true that in a large number of cases of expensive material, such as side rods, axles, or the like, mechanics cannot reapply defective parts, but in other cases we have known where they have tried to procure secondhand parts, owing to the cost of new.

The general effect of this is, therefore, a saving of real

money through the reduction in the value of material carried, caused by greater use of secondhand material; the conserving of material from scrap where the life of usefulness has not been exhausted and the increasing tendency of mechanics and foremen alike to visit the scrap yard to inspect questionable material for reuse and acquaint reclamation foremen with items which can be recovered and repaired or recovered and transformed for other uses. All of this is because of the products of the reclamation plant are conserving the using departments' operating allowances.

In a like manner, this education of material costs is bound to have its beneficial result in reducing wastage and assisting in diminishing the amount of obsolete and inactive material, as the men themselves will make an extra effort to use articles on hand, even at some little inconvenience. In due time, when they have a more general detailed knowledge of values of things which, if not used, must be wasted and charged to scrap, and the difference between that latter value and stock value begins eating into the operating allowance upon which they rely for livelihood, these articles of material, obsolete and approaching obsolescence through inactivity, will be used either for original purposes or in substitution, particularly as much of it can be had at secondhand value and the balance obtained without expenditure of new money, both of which conditions inure to the benefit of the men themselves through steadier employment.

Unit Piling and Pricing Materials



L. B. Wood
Chairman

After investigating the methods applied as tests and otherwise on a number of important railroads, the committee enumerated certain unit piling practices which should not be used. They are:

- (1) The use of trays where material will stack or pile without trays;
- (2) traying loose cotter, nuts, washers, etc., which is permissible but unit piling not recommended; and
- (3) using trays for large items, i. e., brake heads, injectors, lubricators, etc., for the sake of uniformity of practice.

The Best Practices in General Use

Chain: Small chain stored on shelves in storehouses in unit coils, each unit marked at intervals with a suitable marker. Car chains stretched full length on platforms and stored in layers separated by wooden strips and the cumulative count shown on each row by stencil.

Wire: Stored on shelves, floor or platforms in standard rolls as furnished by manufacturers, all sizes arranged in order and unit counted by applying metal tags or other suitable tags of identification throughout the rolls.

Bolts: Bulk bolts stored in original containers, i. e., kegs, crates, etc., in size order on platforms, floor or racks and

the unit mark shown on each lot. Loose bolts stacked numerically in uniform bins or corded in piles on floor and unit count shown on each layer; or by means of a self-counting marker on side of each bin. Where the tray system is used for bolts the cumulative count is shown on the trays.

Flue ends: Stored loose in bins or U-shaped racks in size order. The unit count is indicated by metal tags attached to rows at intervals or stenciled on side of bins. Bulk stock stored in original containers stacked in size order on floor or island platforms, all containers carrying amount and description and unit counted cumulatively.

Bar iron: At larger stations stored on bearings in size order and separated by removable dividers to assist in loading and unloading. Under this arrangement heavy shipments can be handled to and from the piles with cranes, each pile is unit counted and the count indicated by stencil or mark on the iron. Smaller stocks are stored in open front racks, or open side racks. On these storages the unit count is indicated by means of metal tags, stencils or indentures on bars.

Boiler and Miscellaneous Steel: At points where large quantities are stored, is laid flat on bearings in size order with metal markers at intervals through the piles to indicate the cumulative count, or stencils on each sheet as piled. At other places where stocks are not heavy, stored in especially designed racks on edge. Racks are made of scrap rail as uprights embedded in concrete foundations spaced to suit conditions and steel is assembled in the racks in size order, sizes stenciled on the uprights and all sheets stenciled with the unit count.

Pipe and Flues: For outside built storage served by cranes

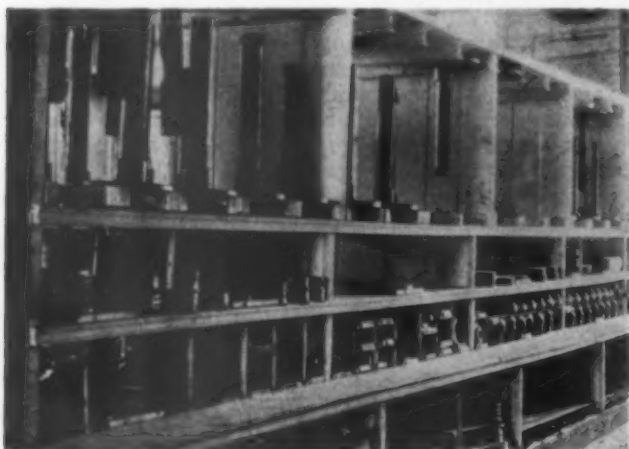
or magnets, is stored loose or in bundles and separated by wood or metal separators. Smaller stocks necessitate storage racks with separate pockets for each size properly marked. When racks are used the pipe is stacked uniformly and evenly, and the unit count indicated by means of a wooden plug in the end of one length in each row properly stenciled cumulatively or by metal marker tags. For brass and copper pipe a side opening rack seems to be favored most.

Springs: Driver and elliptic, stored on platforms or bearings with the numbers stenciled on bearings by metal marker and the cumulative count stenciled on each row. Coil springs stored in rows, separated by wooden strips or in pyramidal piles and unit count indicated by paint stencil or embossed tags.

Lumber: Stored on uniform standard bearings of concrete and scrap rail having suitable pitch for protection from the elements. All lumber stacked uniformly in size and grade order with proper separation strips to aid in seasoning. Regular sheds to meet local conditions used where necessary for kiln dried or finished lumber that requires inside protection. Each pile unit counted cumulatively by means of paint stencil or embossed markers.

Packing Rings: Larger stocks held for shipment to sub stores laid flat on floor. Smaller working stocks in racks and pockets flat or on edge in size order, and quantity stenciled cumulatively on each ring or at intervals as is considered necessary.

Superheater Units: The most satisfactory arrangement found seems to be the storage on ramps or bearings. These are stored in class order with full data on each unit or on



A Method of Storing Pistons

the face of the bearings. All are stenciled with the progressive unit count to facilitate stock taking.

Brake Beams: Stored on material platforms or bearings in uniform rows to a satisfactory height with or without separation wood strips between each row, or in cross piles. The number of beams in each row is indicated on the end beam and the count is carried cumulatively. The full description of the beams are shown on bearings or on an identification plate of a suitable size attached to the last beam when stored on platforms.

Journal Bearings: Stored on platforms, or bins, and piled either by stripping every row, back to back, or cross piling without strips. Another satisfactory method used is by placing bearings in three parallel rows, first rows with lipped end extending outward, second row with lipped end extending to the center, third row same as first. The second layer is then placed on top of first in same manner only crosswise and so on until pile reaches a reasonable height. By this method the bearings tie themselves together and eliminate any danger of the pile falling. Careful stacking is essential to prevent indenture and damage to bearing surfaces. The unit count is used on each row in all cases, and indicated by stencil letters.

Couplers: Stored on end in single rows by kinds where space is plentiful or by doubling the rows by means of reversing them where the space is limited. Each coupler is stenciled with the unit count cumulatively. Knuckles stored in A frame racks.

Pricing Materials

Inquiries from nine large railroads results in the finding of pricing methods being generally uniform.

When material is purchased in bulk, such as lumber, tires, bar stock, steel and other castings, etc., an average price is used. This is obtained by taking the total quantity disclosed at last inventory, or last month's balance, and adding current month's purchases in quantity, then deducting issues for current month based on previous month's price, divide the value obtained by the remaining units to establish a new price.

For miscellaneous material not purchased in bulk, the latest representative invoice price is invariably used. On all of these railroads it was stated that in applying this rule it is expected that good judgment will be used. The latest



Outside Storage of Miscellaneous Castings

invoice price covering a relatively small proportion of the supply on hand is not considered as representative, when the average cost of such supply varies from such invoice price. It has been agreed by officials that the latest invoice price, properly applied, has little effect on the results of inventories, as the law of averages takes care of the differences.

Special items of material ordered and used for specific purposes are charged to proper accounts at actual invoice price.

Several railroads use the bin tag as a price and stock record card. Some have devised the plan of showing the price on the item of material. Prices on all issues are inserted by employees issuing material at the time it is given out. Others use a price book, while still others use a visible



Special Racks for Irregular Castings

price card, and all issues are priced in storekeepers' or accountants' offices.

Methods of pricing second-hand material on different railroads also varies. Some use the price of new material of like kind, while others apply relatively small values by taking certain percentages of new values.

Benefits of Good Pricing

Roads applying prices from bin tags report a reduced clerical force and lower inventory adjustments. Other roads save by having fewer pricing bureaus. On all railroads the conclusion is that reliability of employees plays an important part in the economical measures applied to any pricing method.

Materials are used extravagantly unless the user has knowledge of the values. This is admitted by all railroads. Others keep the employees advised from time to time. Because, in many instances, of the ignorance of employees as to value of materials, the committee feels that the education of the user is of vital importance.

It is the aim of every railroad to make the inventories a thorough check-up of material, to avoid disrupting the operating official's budget. A good pricing method is an important part in accomplishing this result and expedites the handling of inventory.

Committee: L. B. Wood (chairman), general storekeeper, S. P.; O. T. Burleigh, traveling storekeeper, B. R. & P.; H. F. Burnett, general foreman, K. C. S.; C. V. Coulter, district storekeeper, C. C. & St. L.; J. J. Kukis, superintendent of stores, Erie; A. B. Lackey, division storekeeper, Sou.; J. E. McMahon, general storekeeper, C. St. P. M. & O.; F. A. Murphy, district storekeeper, B. & O.; E. H. Nicodemus, general material supervisor, Penna.; F. J. O'Connor, assistant purchasing agent, C. M. & St. P.; A. G. Swanson, piece work inspector, C. B. & Q.; C. H. Thompson, district storekeeper, S. P.; J. C. Jackson, general storekeeper, T. G.; O. Nelson, chairman ex-officio, general storekeeper, U. P.

Discussion

The discussion of this report was opened with extended remarks by U. K. Hall of the Union Pacific who said that he agreed with the report insofar as it covered unit piling, but that he objected to bin or stock pricing of materials. His reason for this, he said, is that the handling and pricing of materials call for the employment of two entirely different classes of men. The section stock man is skilled in the handling of materials and becomes an expert in keeping stocks down and in controlling the material investment. Pricing, in his opinion, is something entirely different and should be the work of the accountant.

In taking this stand Mr. Hall said that he was not unmindful of the advantage of bin pricing from the standpoint of its value in giving the user a knowledge of the cost of the material he is using and, therefore, making him more careful in guarding against waste. However, in his opinion bin pricing is not the most practical method of gaining this end.

E. H. Nicodemus (Penna.): The committee was not in accord on the methods of pricing, or the methods of applying prices. I am absolutely opposed to showing the price on material. Furthermore, it is not the storekeeper's job to price materials. This report is submitted to you for your consideration. They are only suggestions and in the main follow the practices we found in use during our investigation.

H. C. Stevens (Wab.): If the section stockman is qualified to price material why not have him do it? An accountant without material experience cannot price it intelligently. The best answer to Mr. Hall is that if he tried this method for a year he would not return to the old method.

Mr. Hall: We tried it on one division and I am not opposed to educating the users. I am opposed to the method that has been employed so far.

Mr. Stevens: On the Wabash the prices are computed in the office of the division storekeeper by a man who has had both material and accounting experience, but we got far better results when it was done by the man who picked the article off the shelf and who knew when he put the price on a requisition that it represented the price for that particular item. Our check showed that it took about 40 per cent less time for the stock man to handle the material and put the price on the document than it did to correct the description on the same item.

L. O. Thomson (C. N.): We have been doing bin tag pricing for over three years. I do not think we would be willing to go back to the old method of pricing in the office. We work out in our offices and the district storekeeper's office, the unit price on the back of the invoice, the duplicate invoice is then sent to the man in charge of the section. He in turn places that price on the bin tag. In that way we are always sure we connect correct article with the price.

O. Nelson (U. P.): With all due regard to my superior, Mr. Hall, I differ with him on the subject. I have gone over the system on the Milwaukee, the Wabash, and the Southern Pacific. It impressed me



The Hall Was Well Filled Throughout the Meeting

by a great many manufacturers. At first we did not feel we should change from our standard invoice form, but certain conditions came up and I am going to ask Mr. Hagerty who attended two or three meetings of the

results of concerted efforts on the part of interested organizations for the purpose of producing an invoice which would represent the consensus of those most vitally concerned with such a document. It appears,

SIMPLIFIED INVOICE			
NAME, ADDRESS AND TRADEMARK GO HERE			
CUSTOMER'S ORDER NO. AND DATE	REFER TO INVOICE NO.		
REQUISITION NO.	INVOICE DATE		
CONTRACT NO.	VENDOR'S NOS.		
SOLD TO			
SHIPPED TO AND DESTINATION			
DATE SHIPPED	FROM	PREPAID OR COLLECT	
CAR INITIALS AND NO.	F. O. B.		
HOW SHIPPED AND ROUTE			
TERMS			

FOR CUSTOMER'S USE ONLY	
REGISTER NO.	VOUCHER NO.
F. O. B. CHECKED	
TERMS APPROVED	PRICE APPROVED
CALCULATIONS CHECKED	
TRANSPORTATION	
FREIGHT BILL NO.	AMOUNT
MATERIAL RECEIVED	
DATE	SIGNATURE TITLE
SATISFACTORY AND APPROVED	
ADJUSTMENTS	
ACCOUNTING DISTRIBUTION	
AUDITED	FINAL APPROVAL

QUANTITY	DESCRIPTION	UNIT PRICE	AMOUNT
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FACSIMILE OF SIMPLIFIED INVOICE FORM

Endorsed by the Division of Simplified Practice, Department of Commerce, Washington, D. C., after the unanimous agreement of Committees representing both National Standard and Uniform Invoice Forms, February 16, 1927. Users of either Standard or Uniform Invoice Forms are requested to adopt the Simplified Invoice Form when the supply of their present forms is exhausted.

NOTE: To Conform to Standard.

"Customer's Use" block must be exactly as shown.
Designations must all be shown.
Sequence and position of designations must be as shown.
Sizes $8\frac{1}{2}$ " from side to side.

$11\frac{1}{2}$ " from top to bottom.
 $14\frac{1}{2}$ "

Optional for User's Convenience.

Size and arrangement of space for vendor's name, address, trade mark, etc., may be changed as desired.
Spacing both horizontal and vertical, to left of "Customer's Use" block, may be changed as desired.
"Shipped To and Destination" may be arranged for window envelope.
"Quantity," "Description," "Price" and "Amount," columns may be subdivided as desired.
Invoices to retailers should provide a column $\frac{1}{4}$ " wide to the right of the "Amount" column and headed "For Retailers Use."

NOTE:—In case of multiple billing, provide column here for order numbers. If not so used, this space may be added to the width of the other columns

Exhibit A—Proposed New Standard Invoice Form

Division of Simplified Practice, to tell you what happened at those meetings.

Mr. Hagerty (Penna.): I do not think I can give you any information.

[I response to an invitation from Chairman Curtis, E. R. Woodson, secretary of the Railway Accounting Officers' Association, presented a historical background of the circumstances leading to the development of the simplified invoice which was presumed to have been the

however, that this end has not been fully attained and that the drafting of this invoice was subject to much wire pulling and log rolling. He called particular attention to the fact that it is the most complete document of its kind that has ever been drawn. "In fact," he said, "it embodies every suggestion that was made by all of those who had anything to do with it."]

Mr. Baldwin: I think I can stand one more change, but this report suggests that we are going to try it for



Lumber Yard in the Atlantic Coast Line Store Plant at Rocky Mount, N. C.

two years and then assemble all the objections we can to it in the meantime, and the inference is that probably we will then have to have another one. If that is the case, I prefer to retain the standard invoice form until this experiment has been tried out.

A. W. Munster (B. & M.): Can Mr. Woodson advise us what we can expect as to action by the Railway Accounting Officers' Association?

Mr. Woodson: We expect to adopt it. It is being considered by our committee and there is no opposition by the accounting officers so far as I know.

Mr. Laret: This invoice form is endorsed and recommended by the Division of Simplified Practices of the United States, and our reference to a trial for two years, does not mean that everybody can come in and change it. These changes can be suggested to a permanent committee that has been appointed by the Division of Simplified Practices, which is to pass on them. The probabilities are that we will not have any change. We may have, but they will be minor changes if there are any.

[The report was adopted.]

A "Best Paper" Contest Held

A feature of this year's convention was the announcement of the winners of a contest held among junior members of the association for the best paper on purchasing and stores problems, and the presentation of these papers by the authors. The contest was the first one held by the association and was inaugurated to stimulate interest among the younger members of the division in the work and problems of the department. All members below the ranks of assistant purchasing agent and assistant general storekeeper were eligible to participate. The winners were given the honor of presenting their papers personally at the annual convention.

Committee of Judges

These papers were judged by a committee consisting of C. C. Kyle, purchasing agent, Northern Pacific; O. Nelson, general storekeeper, Union Pacific, and J. F. Marshall, purchasing agent, Chicago & Alton. The two prize papers were entitled Growing Executive Timber, by H. F. Burnett, general foreman, stores department, Kansas City Southern, Pittsburg, Kan., and Standardization of Equipment in Stores Department Practices Reduces Stock Investment, by James M. Day, foreman of stores, Southern Pacific, West Oakland, Calif. The judges made no distinction between the winning papers which are presented in part as follows:

Standard Practices and Equipment Reduce Stocks

By James M. Day,
Foreman of Stores, Southern Pacific

Standardization is a word quite commonly used in discussing American business methods. Unfortunately it has more than one accepted meaning, and its meaning in modern management is different from that used in general discussion. In the latter case it refers usually to the designation of some article by size, weight or form, in order that it may always be exactly identified. The article may be tubing, wire, rail, a motor car, or some small part manufactured to be fitted into a car or locomotive. To say that it is standard means that the article can always be obtained, if an order is repeated, in the same size or form without troublesome adaptations being necessary. For instance, if a railway finds that it has 25 different makes of motor cars on its system, it may reduce the number to 5 or 6 and these become "standard." Again, finding that 10 sorts of locomotive smokestacks are in use, they are similarly reduced to 3. The advantage of this reform—having specified sizes and makes which are always to be carried in the stores stock for protection of the equipment—is that it requires a smaller investment of capital, with easier interchangeability of small parts, and enables the stores department

to have parts on hand at all times to meet immediate requirements. Experience has also shown that it is possible to improve the quality of an article which is manufactured in quantity.

A standard article is one which has been carefully considered with reference to its fitness to fulfill the varied needs of service, and has been adopted as the common means of satisfying those needs. A standard practice in modern storekeeping is simply a carefully thought out method of performing a function and, presumably, is the best method that could be devised at the time of its adoption, and when properly carried out it is a constant invitation to improvement.

Standardization Aids

A stores department can proceed much more easily by standardization than by proceeding vaguely without a plan. There must be, however, full co-operation and assistance from the heads of the using departments. Satisfactory results can be obtained only through the whole hearted support from the user, and this can generally be obtained without difficulty when he realizes that all efforts are directed towards giving him service.

Those who are interested in arriving at or changing a standard should make sure that the work is done by experts. After an article has been adopted as standard and the stores department notified, the responsibility for maintaining it in stock falls on the section stockman who handles this class of material. Wherever possible, he should see to it that standard material is not issued for any purpose other than that for which it was adopted originally, and any deviation from a standard should be brought to the attention of the management in order to avoid the use of a large variety of similar items and the holding of obsolete and surplus material in stock.

Two things are insisted upon in modern storekeeping: (1) standardization; (2) the keeping of standard stock records in such a form that they constitute a perpetual inventory from which the quantity of each item of material can be ascertained at a moment's notice, and the pre-determination of the maximum and minimum quantities desired of each item. This is the goal of efficient storekeeping, and the fundamental principle upon which standard stock books should be compiled.

Control Over Stocks

How to keep effective control over store stocks has been given much attention. If a railway is counting its costs carefully, and at the same time trying to get work done more efficiently, it cannot afford, on the one hand, to have money tied up and space occupied by superabundant supplies, nor on the other, to have work delayed for lack of material. To cope with this situation many railways have adopted standard practices of ordering, receiving, storing, disbursing and accounting for material. The control is effected by means of a standard stock

book that guides the storekeeper in providing materials to meet the immediate requirements of the users at all times by basing orders on past performances or monthly consumption.

A storekeeper aiming at a general good order and control, stores his materials and keeps his records systematically. In order to accomplish this he has standard material racks to maintain the stock in sectional and alphabetical arrangement. In the past several years most railway storekeepers have given much consideration to standard practices, which have resulted in the adoption of standards of office equipment for section stockmen, stock books and records, standard accounting forms, material racks, material trays, material tags, unit piling and pricing systems, as well as supply trains, tractor and trailer delivery, reclamation practices, the assembling of material, and many other practices too numerous to mention, all of which promotes better and more efficient storekeeping.

System for Saving

On many railways all material is handled exclusively by stores department employees. This system has resulted in substantial savings in material-handling expense because it permits the development of standard methods and facilities. Furthermore, the stores department can develop and use these improved methods, and effect the savings more readily than other departments which handle material as a side issue and not as a primary duty. When material and supplies are handled by employees of other departments, the handling cost is never accurately known and, therefore, cannot be controlled. On the other hand when handled by the stores department, the cost of doing the work is readily known and can be readily regulated so that proper economy is assured.

Growing Executive Timber

By H. F. Burnett

General Foreman, Stores Department, Kansas City Southern, Pittsburgh, Kan.

Competent man power with able executives is the underlying factor in the success of any organization. Discussions about costs, unit piling and stock control have drawn attention from the human element, but with able men these problems will not be so difficult to solve.

Placing a new man in the organization is a task of importance. He must be taught the fundamentals of the department's activities. He must begin at the bottom under careful guidance. Because of this, a man should be chosen who is going to stay.

New men in the supply department profit most by starting as laborers rather than in a clerical capacity. The beginner who gains first-hand knowledge of material has a great advantage over the office man. He not only learns the names and terms of the different items of material, but also their uses. His constant contact with the men of the shop teaches him to appreciate the shop difficulties and the value of co-operation. The men brought up through the ranks are best fitted for the higher positions.

Need Better Training

All business as now conducted requires specialized training and technical education. The distinction between business and profession is disappearing. Anyone who hopes to achieve success in even a moderate degree must know at least as much about some one thing as another person. The new applicant should be ques-

tioned about his education. Schooling above the average common grades is a premium. Store department foreman and executives must give a great deal of thought to educating their employees. They should be encouraged to attend the night schools and to read railway magazines. The odd moments utilized in pursuing a course of study, reading railway magazines or studying various catalogs, blue prints, etc., are the employee's opportunities. He must be made to realize that the man who is always killing time is killing his own chances.

Promotion Helps

Promotion should be given consideration. It is a good plan, with a man possessing ingenuity and ambition, to switch him around occasionally. Move him from laboring to trucking and from there to the receiving and shipping departments. Place him in charge of different classes of stock. Encourage him to study the peculiarities of material, their proper classifications, etc. When occasion arises when extra help is required in the office, especially during inventory time, the opportunity to place him in this work should not be missed. It will broaden his knowledge of material and give him experience for clerical work.

The germ of enthusiasm must be injected into subordinates. Enthusiasm is the greatest asset in the world. It beats money and power and influence. The enthusiast convinces where wealth can scarcely create interest. It increases production and decreases costs.

He should be taught self reliance. There is no more valuable subordinate than the kind that can be given a piece of work to do with the confidence that it will be done. On the other hand there is no greater nuisance than a weak-backed assistant who does not carry responsibility.

Enthusiasm an Asset

The employee should look at his own case as an exact parallel to that of his railroad. For the money it gets from the public, the railroad gives service. The better the service the more money comes back.

There is no philosophy by which a man can do a thing when he thinks he can't. The reason why thousands of men plod along in mediocrity is because they lack confidence. The man who is continually hesitating as to which of two things he will do first will do neither of them. It is only the man who resolves firmly and executes his purpose with perseverance that can advance to eminence in any line.

Machinery Costly in Poor Hands

We are paying too much attention to the little details in the supply department and in doing so we are overlooking things which will make or break any organization. It is not businesslike to spend hours figuring ways and means of piling bolts and give no thought toward developing the man power of the department. With competent men, hand-picked and trained in a regular manner, the little things which save time and costs will be taken care of as a matter of course. On the other hand, untrained and uninterested men can make no records nor save any money with the most modern machines and facilities. We must secure, train and keep man power above the average.

To build up a competent and trustworthy personnel a supply officer must be willing to devote considerable time and energy to the work and through it all must maintain the patience of a Job and the enthusiasm of a cheer leader. The expenditure of effort in this direction will be repaid manifold.

Report on Uniform Accounting of Supplies

The committee, through the chairman of Division VI, A.R.A., early in the year attempted to get in touch with the president of the Railway Accounting Officers Association. Arrangements were later made and a committee appointed by the chairman of Division VI, consisting of H. C. Stevens, general storekeeper, Wabash; A. L. Sorensen, manager of stores, Erie; and the secretary of Division VI, to confer jointly with the secretary of the Railway Accounting Officers Association for the purpose of bringing about contact with a committee of the Railway Accounting Officers Association. This contact was promptly furnished through the appointment by the Railway Accounting Officers Association of John Hurst, assistant comptroller, Penna.; and B. Lancaster, auditor disbursements, U. P.

Two meetings were held by this joint committee with the results indicated in the report. The report as now rendered was approved by the disbursement committee of the Railway Accounting Officers at its meeting in March, 1927, and will be further considered by the Railway Accounting Officers Association at its annual meeting this year.

At the first meeting of the committee (1925) it was agreed that the following was essential:

1. That the committee be provided with complete details as to present methods of handling charges and credits to General Balance Sheet Account No. 716—Material and Supplies, and Road and Equipment Account 47—Unapplied Construction Material and Supplies, and

2. That it be provided with complete details of handling charges to Material Store Expenses, Par. 16—Special Instructions Operating Expenses.

This information was procured through a questionnaire, and of the 50 railroads canvassed, replies were received from 47, representing a total of 181,645 miles.

(For the committee's statement of aims the reader is referred to pages 1630 to 1633 incl. of the *Railway Age*, Daily Edition, June 11, 1926.)

Action on Questionnaire

Q. (1). Does your monthly balance, Account 716, include the balances representing the value on hand of:

- (A) Road material (all M. of W. & S.). Yes, 88 per cent; No, 12 per cent.
- (B) Shop material. Yes, 100 per cent; No, . . .
- (C) Articles in process of manufacture. Yes, 100 per cent; No, . . .
- (D) Fuel, loco. and misc. Yes, 100 per cent; No, . . .
- (E) Stationery. Yes, 94 per cent; No, 6 per cent.
- (F) Dining car supplies. Yes, 96 per cent; No, 4 per cent.
- (G) All scrap. Yes, 94 per cent; No, 6 per cent.
- (H) Misc. materials and supplies other than those for shop and M. of W. & S. purposes. Yes, 100 per cent; No, . . .
- (J) Uncleared store expense. Yes, 40 per cent; No, 60 per cent.

Action: In accordance with the provisions of Interstate Commerce Commission Classification Account 716 all materials and items covered by Questions (A) to (H) inclusive, should be charged as and when the invoice is approved for voucher to Account 716. This account should be credited only as and when the materials are applied, except small tools, supplies and oil and waste which should be credited therefrom as and when delivered to the using departments for current use, and it is recommended that this general observance of Account 716 be made universal. The only exception the committee makes to this procedure is in connection with items properly chargeable and creditable to Road and Equipment Account 47 hereafter referred to. Materials covered by question (J) should be carried in general balance Accounts 727 or 778.

Q. (1). (K) Purchased materials received but for which invoices have not been formally debited to the departmental material balances.

- A. Yes, 30 per cent; No, 70 per cent.

Action: It is the sense of this committee that all material received should be included in the report of stock on hand, but should not be passed through Account 716 until invoices are actually vouchered.

Q. (1). (L) Cash discount invoices paid but on which the materials have not been received.

- A. Yes, 60 per cent; No, 40 per cent.

Action: A memorandum record should be kept of such items. Such invoices should be included in Account 716, but not in the material stock report.

Q. (1). (M) Materials retired from property and equipment, but not released.

- A. Yes, 32 per cent; No, 68 per cent.

Action: Not recommended.

Q. (1). (N) Postage stamps.

- A. Yes, 51 per cent; No, 49 per cent.

Action: Recommended.

Q. (1). (O) Labor items not properly chargeable as part of material costs.

- A. Yes, 12 per cent; No, 88 per cent.

Action: It is recommended that the practice of including unrelated labor expense items in Account 716 be discontinued.

Q. (1). (Q) Additional items.

Action: Replies from the majority of the railroads show practically no additional items for inclusion in Account 716. However, where companies operate hotels, steamships, marine equipment, etc., the unapplied material should be carried in Account 716.

Q. (2). Do you charge any of the following groups of materials to operating expenses or investment accounts prior to its actual application? Actual application as here used does not apply to current useable material on shop floors.

- (A) M. of W. & S. materials for maintenance. Yes, 26 per cent; No, 74 per cent.
- (B) M. of W. & S. materials for additions and betterments projects. Yes, 11 per cent; No, 89 per cent.
- (C) Shop material (loco.). Yes, 2 per cent; No, 98 per cent.
- (D) Shop materials (cars). Yes, 2 per cent; No, 98 per cent.
- (E) Other materials. Yes, 7 per cent; No, 93 per cent.

Action: The committee recommends that with the exception of small tools, supplies and oil and waste delivered to foremen for current use, all materials be carried in Account 716 until actually used. Materials for Additions and Betterment projects should be charged out of Account 716 only as and when used, and locomotive shop, car shop, and other materials should be charged out only as and when issued for current use.

Q. (3). Do you feel that the charging out of any materials (not tools and supplies distributed to the using departments) before their actual use is contrary to the "All Unapplied Material" stipulation of Account 716? Yes, 81 per cent; No, 19 per cent.

Action: It is the sense of the committee that the charging out of any materials, not small tools and supplies, or oil and waste for current use, before their actual use, is contrary to the, "All Unapplied Material" stipulation of Account 716.

Q. (4). Do you have working stocks, i. e., stocks as indicated below where the previous inventory value is carried as stock until another inventory is taken, at which time the fluctuations in value are charged or credited to operating expenses? During the inventory intervals the replenishments are charged out.

- (A) M. of W. & S. materials. Yes, 20 per cent; No, 80 per cent.
- (B) Shop material (frt. car). Yes, 35 per cent; No, 65 per cent.
- (C) Shop material (pass. car). Yes, 26 per cent; No, 74 per cent.
- (D) Shop material (loco.). Yes, 14 per cent; No, 86 per cent.
- (E) Other material. Yes, 2 per cent; No, 98 per cent.

Action: The committee recognizes the necessity, according to local conditions, of carrying working stocks, where the previous inventory value is carried as stock in Account 716 until another inventory is taken, at which time the fluctuation in value is charged or credited to operating expenses. During inventory intervals the replenishments should be charged out. It is suggested, however, that the amount to be carried be minimized and inventoried at stated periods throughout the year. The value of these accounts, however, is greatly dependent upon proper policing and charging out of the replenishments. Working stocks are recommended on the basis of economy to the railroad company and without creating improper accounting.

Q. (5). Is it your practice to carry materials for new roads and extensions in Road & Equipment Account No. 47?

- A. Yes, 4 per cent; No, 96 per cent.

Action: The committee feels that Road and Equipment Account No. 47 should only be used to cover the cost of materials and supplies located at the point of use, held exclusively for projected new roads and road extensions and under the condition that the material will not be used for other purposes.

Q. (6) Is scrap released from service charged to the material account and credited to operating accounts, etc., on the basis of the release or when sold?

- A. Released, 91 per cent; Sold, 9 per cent.

Action: It is the sense of the committee that when scrap is released proper credit be allowed to operating account and charged to Material Account 716 at the time of release.

Q. (6). (A) At what value is serviceable released material carried in stock (this includes material released which can be used without work thereon and that which requires work thereon)?

- A. The replies indicate varying practices regarding "Values on Released Materials" from scrap to cost of new material.

Action: It is immaterial at what price the released material is carried, provided such material is charged to closed accounts at the price at which it is carried in Account 716. Approved that it should be credited to operating accounts. A comparison between roads should be on the basis of turnover.

Q. (6). (B) If such material is released and credited as scrap, and later used and priced at new value or a fixed percentage thereof, what disposition is made of the margin between the scrap credit price and the issue price?

- A. The general practice is to credit to operating accounts.

Action: It is immaterial at what price the released material is carried provided such material is charged to closed accounts at the price at which it is carried in Account 716. It should be credited to operating accounts. A comparison between roads should be on the basis of turnover.

Q. (6). (C) If such material is carried and reissued at the scrap price, to what is the expense of reconditioning charged?

- A. The general practice is to charge to the accounts benefited.

Action: It should be charged to accounts benefited.

Q. (7). Do you interpret Account 716 as instructing that the latest cost price should be used on issues and inventories?

A. Too varied for concise tabulation.

Action: It is the sense of the committee that on all disbursements and inventories the cost price to the railroad, as provided for in Account 716 should be used; this does not mean that average prices for charge-outs do not constitute cost prices, and replies from the majority of carriers indicate that this is the universal policy. It is the committee's opinion, based on replies received, that variations in Account 716 due to minor differences in pricing methods for purchased material have very little effect on the balances.

Q. (8). Do you take up as disbursements the value of raw materials issued on manufacturing orders and also show the finished product as a disbursement when used?

A. Replies indicate that many railroads, in arriving at their system turnover, include two, and many times, three disbursements for raw materials used in the manufacture of finished products.

Action: For the purpose of arriving at system disbursements and system results to express a month's supply on hand there should only be included the value of materials charged to operating expenses, property account, individuals and companies, and other closed accounts.

Q. (9). Do you believe there should be a uniform classified balance sheet that all railroads would use to state the monthly material and supplies balance, as carried in Account 716; this balance sheet to show also the monthly receipts, disbursements, balance, turnover, etc.

A. Yes, 69 per cent; No, 31 per cent.

Action: It is recommended that there be adopted a uniform classified material balance sheet in form and general headings as shown in Exhibit A.

MATERIAL STOCK REPORT

as of....., 1922

Item	Classification	Actual Disbursements to Closed Accounts and Sales	On Hand End of Month	Day's Supply On Hand End of Month (Based on 30 day mo.)
(1)	(2)	(3)	(4)	(5)
1.	Ties, Cross and Switch. (Including ties at treating plants). Class 5.....	....	....	....
2.	Rails. (Scrap not included). Class 8.....	....	....	....
3.	Frogs, Switches and Rail Fittings. Class 1-A and B.....	....	....	....
4.	Bridge and Building Lumber, Iron Bridges, Turntables and Structural Steel. Classes 4 and 6.....	....	....	....
5.	Signal, Interlocking, Telegraph and Telephone Material. Class 2.....	....	....	....
6.	All Other Maintenance of Way Materials. Classes 1-C and D, 3, 7, 9 and 10.....	....	....	....
7.	Maintenance of Equipment Material. Classes 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33 and 35.....	....	....	....
8.	Material in Process of Manufacture. Class 34.....	....	....	....
9.	Fuel. Classes 39 and 40.....	....	....	....
10.	Miscellaneous Material common to all Departments. Classes 36, 37, 38, 42, 45, 46, 47, 48 and 49.....	....	....	....
11.	Dining Car and Restaurant Commissary Supplies. Class 41..	....	....	....
	Total—Items 1 to 11....	....	....	....
12.	Scrap. Class 50.....	....	....	....
	Grand Total.....	....	....	....

NOTE.—(a) Show all values in dollars, omitting cents.

(b) Use A. R. A. classification adopted at June, 1922, meeting. Where classes are stated above, it should be understood to include all sub-divisions of such classes, except where a separation is indicated.

*—Average per month for the quarter.

Exhibit A—A Recommended Form for Reporting Materials

Q. (10). Do you recommend that a report of material and supplies account, divided into certain designated items only, be prepared from a classified material balance sheet, having no effect whatever on the general balance account 716?

- (1) Statistics to be furnished to the American Railway Association, through the secretary of Division VI, Purchases and Stores.
- (2) Each railroad to send a monthly copy of its classified balance sheet, Exhibit A, from which the A. R. A. Bureau will prepare statements indicating the following for each of the 14 accounts listed:

(A) Amount on hand at end of month for which reporting.

(B) Month's actual disbursements to closed accounts, including individuals and companies.

(C) Month's supply on hand.

A. Yes, 85 per cent; No, 15 per cent.

*The "Yes" replies in many instances, however, indicated different divisions.

Action: Suggestion made that wording reading "Classified balance sheet" be changed to "Material Stock Report."

Instructions—Material Stock Report

1. Carriers not using the A. R. A. Standard Material Classification are requested to have the number or letter symbols of their material classes, or sections, included in the 12 items listed printed on their forms, instead of the Standard Classes. Such railroads are requested to submit a summary of their material classification with the first material stock report submitted to the A. R. A.

2. The "On Hand End of Month" figures reported should be the value of all unapplied materials on hand whether vouchered or not, including the value of purchased materials received but for which invoices have not been formally debited to Account 716.

3. Reporting carriers are requested to include in their reports the "Actual Disbursements" and "On Hand End of Month" figures of all subsidiary lines for which they prepare a general balance sheet and where any such subsidiaries are included, it is requested that the names thereof be stipulated in the heading of the report.

4. Carriers are requested to submit their quarterly report to the American Railway Association within 45 days after the close of the period reported.

5. The association will segregate the reports received into regional groups and prepare a quarterly tabulation for each such group. This regional tabulation will show for each railroad included therein (1) name of reporting carrier, (2) on hand end of month figures, (3) days supply.

6. The tabulated regional reports are for distribution only to such carriers as furnish quarterly material stock reports to the association and the latter will furnish each reporting carrier with copies of the tabulated reports for all regions.

Q. (11). Do you maintain records indicating the cost of handling materials by points, and the total store expense for railroad by points?

A. Yes, 83 per cent; No, 17 per cent.

Action: The committee recommends that separate local costs be maintained for the handling of materials and scrap on the following basis:

For materials: On the basis of \$1,000 material actually charged to close accounts by storehouse forces or by other forces, charges for which are made against material stores expense, this cost to exclude shop costs.

For scrap: On the basis of the net tons sold (including material taken from scrap, good for reclamation) where the costs for handling are determined at points where the scrap is handled for sale. Cost of handling at other points to be made against material costs.

Q. (12). (A) Do you make deliveries to using departments, and if so is the cost of delivery charged to Store Expense?

A. Yes, 72 per cent; No, 22 per cent.

If delivery men are carried on the Store Department payroll, is the charge made to other than store expense?

Yes, 67 per cent; No, 33 per cent.

Action: The committee recommends that the stores department be charged with the duty of delivering material to the point of actual use and that the expense of such delivery should be charged to Material Store Expense. Incidental delivery by employees of other departments should be absorbed by those departments.

Q. (12). (B) In arriving at your costs, do you distinguish between material and scrap?

A. Yes, 70 per cent; No, 30 per cent.

Action: Should be distinguished as referred to above.

Q. (12). (C) Is the cost of scrap handling charged to revenue from scrap?

A. Yes, 57 per cent; No, 43 per cent.

Is the cost of scrap handling charged to Store Expense?

Yes, 43 per cent; No, 57 per cent.

Action: The cost of handling scrap should be charged to revenue from scrap.

Q. (13). What would be a fair measure of comparison for cost of handling?

A. Varied replies.

Action: Per \$1,000 of material charged to closed accounts and per net ton of scrap sold and reclaimed.

Q. (14). Show detail of basis on which stores expense is distributed to expense accounts.

Q. (15). Explain in detail all items which are included in and charged to store expense.

Action: Owing to the extended variations in charges to material stores expense and sensing this as a matter of accounting distribution, it is the consensus of opinion that a point of contact should be maintained through a joint committee of the Railway Accounting Officers Association and Division VI and that such a committee should prepare appropriate rules and procedures for

all detail items which may be included in Material Stores Expense and enumeratae them, and where other items are being charged to Material Stores Expense that belong to other accounts, rules be made for the disposition of such items in other accounts.

Committee: A. L. Sorensen, (chairman), manager of stores, Erie; W. E. Brady, traveling accountant, A. T. & S. F.; O. L. Browne, assistant to purchasing agent, A. C. L.; O. A. Donagan, general storekeeper, B. & M.; D. V. Fraser, assistant purchasing agent, M-K-T; A. A. Goodchild, general storekeeper, C. P. R.; E. Harty, assistant general storekeeper, S. P.; L. P. Krampf, supply agent, M. P.; R. D. Long, assistant general storekeeper, C. B. & Q.; J. C. McCaughan, general storekeeper, H. V.; O. B. Mills, assistant general storekeeper, Penna; C. H. Murrin, special accountant, I. C.; J. L. Sullivan, general traveling storekeeper, U. P.; W. O. Wallschlaeger, chief stockman, C. M. & St. P.; C. C. Dibble, (chairman ex-officio), general supervisor of stores, N. Y. C.

Discussion

A. L. Sorensen (Erie), chairman: With reference to Question 1—(A) to (J); road and equipment account, No. 47. The Accounting Committee inferred that this account would be eliminated in the new classification and it was thought desirable that some action be taken by the division with reference to its desires in this connection.

J. W. Gerber (Sou.): With reference to Question 1, (A), (B) and (C); do I understand that you would charge out at scrap prices for material which was served previously?

Mr. Sorensen: The question is whether to release it at scrap or at a higher price. Some railroads release it at scrap; others may use 50 per cent or 75 per cent of the valuation of new material.

Mr. Gerber: If we apply it just the same as new material, expenses must bear the charge.

Mr. Sorensen: The committee considered that this was a matter which should be regulated entirely by the managements of the railroad; it is a matter of policy, and not one on which any general well defined and definite principle can be laid down that will apply to all railroads. In the case Mr. Gerber cites the material would, under this ruling, be released at scrap prices and reissued at scrap prices.

Mr. Gerber: Expenses should bear the true value of the material, not a scrap value. If it is used as a piece of material that is proper to be applied, then the expenses should bear the cost of the item as material, not as scrap.

Mr. Sorensen: Then it should not be credited as scrap at the time it is released.

Mr. Gerber: We often release material that we do not know whether we will apply again. Therefore, we take it in as scrap. If it is used, it goes into the accounts just as new material would, and expenses get the credit, but expenses must be charged with what they should be charged.

Mr. Sorensen: We release considerable material at a definite per cent. Occasionally we find material that we are told is usable, but later find is not. We charge it back to expenses immediately and let the department concerned absorb it in the division operating expenses.

W. F. Jones (N. Y. C.): On the New York Central we are destroying equipment that is obsolete, but we do get air brake material, truck frames and other items that are just as good today as they were when they were first applied, and possibly as good as the material of similar design that we are buying now. I believe our figure is 60 per cent of the original cost and that that 60 per cent is charged back when we use it. I believe the report should be continued or perhaps the committee could adjourn now and return later with a recommendation that we adopt a good value for second-hand material.

H. C. Stevens (Wab.): The point at issue in (A), (B) and (C) is the basis on which the material is taken back into stock. When reapplied it must be recharged to the accounts for the benefit of which it is finally used,

at the same price at which it was taken into stock. At a matter of fact, I believe the accounting officers and the Interstate Commerce Commission will force us to do that some time, whether or not we approve. I move that Sections (A), (B), and (C) be accepted.

C. D. Young (Penna.): I object to the motion. The subject of carrying released material at any price is one of the causes of inventory differences. Certainly it cannot be immaterial. This subject ought to be approved to give storekeepers some relief in the handling of their stocks where they cannot recognize reclaimed or second-hand from new. Local officers may adjust their accounts and expenses against a budget to meet a situation by varying their ideas of the quantity of second-hand or new material that has been issued in that month in order to square up an operating charge. That also is a very vicious accounting practice when you do not have close supervision over the price of the reclaimed second-hand material that is issued. Rather than have the Purchase and Stores division agree that it is immaterial at what prices we charge this released material, as outlined in the recommendations (A) and (B), it is preferable for us to refer the matter back to the committee for further consideration. I would like to amend the motion to that effect, namely, that the recommendations contained under (A) and (B) be referred back to the committee and (C) be adopted.

E. G. Ellenberger (Penna.): Everybody is affected by released material. One of the first requisites of a uniform comparison for balance sheets is the establishment of a unit of uniform price for released material. We can not make comparisons of one road with another if we do not have the requisite data because the used and new materials are directly comparable with that in your stock balance.

W. Davidson (I. C.): The committee has handled this proposition very well and has brought it to a position where we will not be criticized by the accounting departments of the carriers by adopting this recommendation. If you turn it back to the committee we may get the same recommendation next year, and we might as well act on it now and get through with it.

U. K. Hall (U. P.): I agree with Mr. Davidson. I think we should realize that if we vote for the amendment we are voting to turn down the report of the Joint Committee and we can better afford to go along on a proposition that, after all, will be decided according to the individual opinions of the managements and accounting departments. I hope we do not vote for the amendment, but that we support the committee after the hard work it has done.

W. W. Griswold (W. & L. E.): We find it impracticable to carry two sets of prices. Where material that is usable is turned in, we allow a credit of 100 per cent.

Mr. Stevens: The representatives of the accounting officers were of the opinion that the small per cent of material that might remain in stock at the end of a month as compared with the same kind of material that went out of stock in that month would not have any effect whatever on inter-road comparisons of materials on hand, and the remaining members of the joint committee were of the same opinion after giving that question due consideration.

Mr. Young: If I have the permission of my second, I will withdraw the amendment, providing the committee will change its report to read: "For comparative purposes only," the rest of it to remain as it is so that our section will not go on record as taking the attitude that it is immaterial at what price second-hand material is carried in stock.

Chairman Curtis: The chairman of the Accounting

Committee says it is satisfactory. Do you withdraw your amendment?

Mr. Young: Yes.

Mr. Sorenson: It is corrected so that it will read "For comparative purposes, only it is immaterial at what price, etc."

E. R. Woodson (Secretary, Railway Accounting Officers' Association): It seems to me that now it is all right. We might put those words before every recommendation and accomplish the same purpose. I do not see that it does any harm and it may clarify the situation a little bit.

[The original motion to adopt Question 1, A to J, was then carried.]

[Chairman Sorenson then submitted the Revised Material Stock Report. This was discussed at some length by G. G. Yeomans, who contended that it would have been possible to draft this in such a way that it would be of greater value to the executive officer in reviewing the purchasing and stores operations of the property. A motion to adopt the form was carried.]

The section of the report on Material Handling was accepted with little discussion.

Mr. Sorenson: This committee recommended that the stores department be charged with the duty of delivering material to the point of actual use and that the expense of such delivery be charged to Material Store expense.

Mr. Davidson: I do not like to see this division go on record as dictating to the accounting officers how we should charge material to expenses. I am not in favor

of charging shop delivery to store expense regardless of how the accounting officers rule on the question. *I move that we omit the part of the committee's recommendation reading "and the expense of such delivery should be charged to Material Store expense."*

U. K. Hall (Union Pacific): I support Mr. Davidson. If we deliver material to the shops we are taking over a function which if we did not perform, would be shop expense.

Mr. Stevens: The joint committee developed with the accounting officers' representatives that apparently the original intent of the Interstate Commerce Commission rules was that in cases similar to this one of store department employees delivering materials to shops, the cost should be absorbed in material store expense. We are all strongly in favor of the stores department delivering material, at least in the larger shops.

A. G. Roberts (Sou.): We have no more right to charge to stores expense the cost of delivering to the mechanical department than we have to charge to stores expense the freight on that article.

Mr. Sorenson: I am not trying to take issue with this ruling. I am merely citing why this ruling was put in as is, and after all, we must follow the accounting department and the Interstate Commerce Commission rulings.

Mr. Hall: I do not believe we have the right to come out here now and try to influence the decisions of the accountants by saying that we, the storekeepers, approve.

[Mr. Davidson's motion was carried, after which the section under discussion was adopted.]

Handling and Controlling Line Stocks

By K. P. Anderson

General Material Supervisor, Pennsylvania, Philadelphia, Pa.

Line stocks comprise material shipped to line of road consigned to users at specific locations or distributing points. This may mean lumber, cement, structural steel, etc., shipped to master carpenters; crossing frogs, switches and joint bars to track supervisors; cable, switch and lock movements and relays to supervisors of telegraph and signals; journal bearings, air hose and brake shoes to car inspectors, etc.

The control of this material has been a problem to the stores department. Some roads have depended largely on periodical inspections, which normally only scratched the surface and by no means corrected the fault. There are several more practical methods. Line stocks of the maintenance of way department on the Pennsylvania are largely controlled by allowing each point an authorized working stock and charging it out on a replenishment basis. These stocks consist chiefly of standard material.

Supervision of this material by the stores department commenced several years ago and its control is being gradually improved upon. All requisitions covering material amounting to \$100 or over are prepared, showing the approximate date the material is to be used, and are forwarded to the division superintendent and general superintendent for approval before being passed to the general storekeeper. He may go further and have the general manager approve the method before passing to the purchasing agent.

When the business is actually placed, the purchasing agent forwards a copy of the requisition to the reporting or ordering storekeeper, who enters the requisition number and the item on his stock card, and holds this copy until the consignee receives the material and forwards

the receipt to him. The item is then shown on the stock card with the date of receipt and remains a live item until the user forwards a charge-out slip. If, after a reasonable time, the item has not been charged out, the reporting or ordering storekeeper first ascertains if the item is still on hand and unapplied; if not, he secures a charge-out slip and closes the account. If it is on hand, he determines why. Often, the use of the item is speeded up by calling it to the attention of the division superintendent or general superintendent. This takes care of all the large special items shipped to line of road, either direct from the manufacturers or from storehouse.

On such items as frogs, switches, guard rails, joint bars, cable, etc., shipped to line of road, stock cards are maintained, started at the annual inventory and carried forward by adding the receipts to the on-hand and deducting the consumed, giving a new on-hand figure each month at the ordering time. Stock cards of the most important items shipped to line stocks cover approximately 95 per cent of the total money value.

Carrying stock cards of material shipped to supervisors gives the ordering storekeeper the information he must have to control his ordering properly. All standard material is shipped by manufacturers to his storehouse, and is shipped from there to the using point. By using the actual consumption from line stock cards, he uses a more accurate figure than if he used the figure of the storehouse shipping to the user. He is also able to liquidate surplus stock in one supervisor's line stock to another supervisor who may need the material. While this may not be the most practical or economical method of control, it is well worth the effort expended.

Carrying Cost of Material and Supplies



E. H. Hughes
Chairman

Investigation has developed the need of some definite basis that will be applicable to all railroads, fundamentally at least. The committee submits eight classified subdivisions which should properly be included to arrive at a definite carrying cost.

A questionnaire was prepared and submitted to a number of railroads, using these eight classified subdivisions, which are shown below, as a basis.

Interest on Investment: There can be little or no argument as to the inclusion of this item.

Cost of Handling: This expense like interest cannot be ignored in any computations and in questionnaires put out

by this committee it has been the aim to have all items included in this account as prescribed by the I. C. C., such as all stores forces and charges from other departments for labor performed, handling stores, cost of accounting, supervision, cost of supply train or car operation, purchasing, inspection, heating, lighting and power, switching, traveling expenses, stationery and printing, etc.

Obsolescence: This subject has many angles and we believe that a close study is necessary on each individual line, due to the fact that the rate of obsolescence on some lines will be higher than others owing to the state of advancement. For example, a line with large installations of signal and automatic train control will find perhaps that its rate of obsolescence is much greater than lines not so equipped.

Taxes: While no direct charge is made against material and supply accounts for taxes this source of expense is ever present and increasing from year to year.

Insurance: Material and supply investment should rightfully bear its pro-rata share of this expense.

Interest on Investment in Stores Facilities: In this should be included cost of investment in stores, buildings, sheds, cranes, trucks, tractors and other equipment necessary for the storage of materials and supplies.

Deterioration, Depreciation and Waste: This loss is a hidden one and impossible to prove by figures. However, even with the present close attention, such as spraying, etc., given to materials subject to deterioration and the closer physical control being obtained from year to year cutting down on losses due to depreciation and the constant watchfulness to prevent waste, these losses are being suffered and should rightfully be considered in this study.

Transportation Over Line: This expense should be considered, as the service for materials transported represents a definite charge. The rate of 5 mills per ton mile as prescribed by the I. C. C. should be used.

Recommendation: It will be noted from replies to the questionnaire as indicated in Exhibit A that a wide variance is found in the figures submitted, and therefore the committee does not recommend a definite percentage basis to be used by all, but does recommend that the eight classified subdivisions be adopted and used as a basis for future deliberations on this subject.

Committee: E. H. Hughes (chairman), general storekeeper, K. C. S.; W. B. Hall, purchasing agent, D. & R. G.; B. T. Adams, assistant general storekeeper, I. C.; M. B. Bowman, storekeeper, N. Y. C. & St. L.; F. I. Foley, assistant general storekeeper, N. Y., N. H. & H.; J. H. Karl, storehouse inspector, Erie; F. S. McClung, purchasing agent, L. & P.; E. G. Roberts, division storekeeper, C. R. I. & P.; C. D. Young (chairman ex-officio), general purchasing agent, Penna.

Discussion

J. R. Cullett (Penn.): Were the figures covering obsolescence taken from actual book values or were they estimated?

E. H. Hughes (K. C. S.), chairman: On our own road these are actual figures which are the average of a three-



Iron Shed on the Great Northern at St. Paul, Minn.

year period. Some of the other figures may have been estimated. We requested exact figures, but they may represent averages.

[A motion to accept the report was carried.]

Exhibit A—Table Showing Range of Values Recommended by Various Roads in Determining Carrying Costs

Road	Interest on material and supplies investment No. 1	Cost of handling No. 2	Obsolescence No. 3	Taxes No. 4	Insurance No. 5	Interest on investment in stores facilities No. 6	Deterioration, depreciation and wastage No. 7	Transportation over own line No. 8	Total per cent
A.....	6.00%	6.16	No reply	Inc. in No. 6	.30	0.40	No reply	No reply	12.86
B.....	6.00	8.00	.10	.10	.50	1.00	1.00	2.00	18.70
C.....	5.00	7.00	.50	1.00	.50	.50	.10	13.00	27.60
D.....	6.00	5.00	.07	2.75	3.50	.75	.50	3.00	21.57
E.....	5.00	9.00	2.00	2.10	.25	.25	1.00	.50	20.10
F.....	6.00	5.00	1.67	No reply	.25	.50	No reply	2.00	15.42
G.....	6.00	4.40	4.00	.50	.90	.40	1.00	2.00	18.55
H.....	6.00	3.00	2.00	.50	.25	.25	.05	.05	12.75
I.....	5.00	5.00	2.00	.60	.25	.30	1.30	.50	14.95
J.....	6.00	6.50	1.00	2.00	.50	.50	1.00	.20	17.70
K.....	6.00	9.00	1.50	.67	.20	No reply	No reply	No reply	17.37
L.....	6.00	6.00	2.00	.50	.20	.02	1.50	No reply	16.22
M.....	6.00	7.00	3.00	2.00	Inc. in No. 2	6.00	3.00	No reply	27.00
N.....	3.00	5.00	1.00	.75	*2.00	.75	.50	5.00	19.50
O.....	5.00	3.00	4.00	(1.00)	.50	.50	1.00	2.00	17.00
Totals.....	83.0	89.06	24.84	14.47	8.85	14.87	11.95	30.25	277.29
Average of all roads replying.....	5.33	5.94	1.77	1.11	.630	1.06	1.00	2.75	18.486
Average of 10 roads replying complete.....	.....	.....	.....	.....	.....	.....	.....	.....	18.842
Average of 5 roads replying in part.....	.....	.....	.....	.....	.....	.....	.....	.....	17.774
RECAPITULATION									
Number of roads solicited.....									33
Number of roads replying complete.....									10
Number of roads replying in part.....									5
Number of roads information not available.....									3
Number of roads not replying.....									15

* NOTE.—This railroad in reply set up 2 per cent covering Items Nos. 4, 5 and 6. Inasmuch as this was a complete reply we divided this 2 per cent as follows: 1 per cent Item 4, and 5 per cent each Items 5 and 6 in order to complete detail of these three captions.

The Place of the P. & S. Officer in Railway Transportation

By Samuel O. Dunn
Editor of the *Railway Age*



S. O. Dunn

The magnitude of the railroad industry is reflected in the magnitude of its purchases. Experience indicates that under existing conditions and prevailing prices the railroad industry's purchases of equipment, materials and supplies and fuel are and should be about two billion dollars annually.

The purchases made by so vast an industry largely determine the general prosperity of the country. There is hardly anything that railroads do not buy, and they afford one of the very largest markets for many of our important basic industries. When, therefore, their purchases are relatively large, they contribute greatly to activity and prosperity in the railway equipment and supply, the iron and steel, the lumber, the coal, the oil and many other industries. When their purchases increase they help make possible the employment of more labor and the purchase of increased materials of many kinds by these industries, and thereby contribute to the well-being of all classes of people. The opposite effects are, of course, produced when railway purchases decline below normal.

Volume of Expenditures Depends on Earnings

The desirability from the standpoint of all concerned of ample and stable purchases by the great railroad industry should be obvious. The volume of the purchases it can make from year to year, however, cannot be determined entirely or even mainly by its own officers. It depends upon total earnings and these, in turn, upon the traffic that is available and the rates that may be charged for handling it. If total earnings are too narrowly restricted by lack of traffic, or by undue depression of rates by regulation, it becomes necessary not only unduly to curtail maintenance expenditures but also unduly to curtail capital expenditures. Maintenance expenditures must be made out of gross earnings, and the amount of capital expenditures that can be made depends upon net operating income.

The contribution that the railways can make to the public prosperity and welfare, therefore, depends partly on the way they are regulated and partly on the way they are managed and operated. Ever since 1921, when the entire railroad system of the country was on the verge of bankruptcy, there has been a steady improvement in total earnings and net earnings, and this has resulted within the last four years in a comparatively large and stable program of improvements and purchases. These improvements and purchases, and the improvements in service and increases in operating economy to which they have led, are generally conceded by business men to have contributed in a very large measure to the unusual prosperity that has prevailed in most industries.

Influence of Purchases and Stores Officers

To the great improvement in railway operating and financial results that has been effected within recent years the purchases and stores officers have made a very large and notable contribution.

Perhaps in view of the peculiar character of some of

the greatest problems of the industry it may not be amiss to emphasize the extent of the influence purchasing and stores officers can exert upon public sentiment affecting the railways. If all those who directly and indirectly supply their needs through the purchasing departments could be made to realize the dependence, not only of the prosperity of the country, but of their own prosperity, on the progress and prosperity of the railways, they could, and probably would, exert upon public sentiment an influence that would be very beneficial.

As I have reflected upon the activities of the purchases and stores department of a railroad it has seemed to me it might be most aptly compared to a large mercantile company operating a chain of stores. It buys, carries in stock and distributes a quantity of commodities far in excess of that handled by any but the largest mercantile concerns. It does not operate for its own profit, because the things it supplies are charged out at the same prices for which they are bought, but the skill with which the purchases and stores department buys and meets the requirements of all other railroad departments, does, in a large measure, determine the net earnings of the railroad of which it is an integral, important and essential part. A purchases and stores department that always bought when prices were low, that always charged out materials and fuel when prices were high, that never carried any larger stocks than were needed, but always was able promptly to supply all the things that were needed, would, indeed, be "a thing of beauty." If no purchases and stores department ever has succeeded in attaining this ideal, it reflects no discredit on purchases and stores officers. It is the ideal that every great merchant always is aiming at, and those who have succeeded in most nearly attaining it have made large fortunes; and yet it has been only six years since we saw many of the largest mercantile establishments in this country virtually bankrupt because their managers forecast the future so badly that they accumulated huge stocks at the highest prices ever known and when we were on the verge of the most precipitous and headlong decline of prices which, apparently, ever occurred in this country.

They Have a Good Record as Merchants

As we survey that period in retrospect we find that the record made by railway purchasing officers in anticipating future developments probably was as good as that of most merchants whose serious failure to anticipate them might mean ruin to their concerns. If a merchant is to avoid going broke, he must not buy at the top of the market and sell at the bottom. At the same time, if he is to stay in business he must carry enough goods to be able at all times to fill orders of his customers with reasonable promptness. If he is able to fill orders with reasonable promptness, probably the best measure of whether he is carrying stocks that are too large or too small is the rapidity of his turnover. At the end of the year 1920 the inventories of the largest mail order house in this country were 41 per cent of what its gross sales had been during the year. It seems not improbable, in view of the general business situation that then and for some time subsequently existed, that most other large mercantile concerns had inventories relatively as large. The railways at the end of 1920 had stocks on hand amounting to only about 37 per cent of the amounts charged out for fuel, materials and supplies used in operation during that year, and this figure was smaller

than that for any of the preceding four years.

"Experience is the best teacher, but she keeps a dear school." Experience during the war years and those immediately following was very expensive, but from it the business men of this country have learned some lessons that have since been of enormous value. They have learned the importance of avoiding excessive inventories, and the value of good and ample freight transportation service, as they never did before. Largely as a result of heavy buying in this country by the warring nations of Europe there was a sudden increase in 1916 of 25 per cent in the freight business handled by our railways. In 1920 the increase had become 50 per cent. During the five years preceding this enormous increase of traffic there had been, owing to extremely restrictive regulation, a great decline in railroad development. In spite of the prodigious efforts made by the railway personnel during the war years, and immediately after, which resulted in an increase of 50 per cent in the amount of freight actually handled, the transportation service rendered was extremely unsatisfactory. "Car shortages" were chronic. Being unable to get freight moved promptly, business concerns of all kinds increased their inventories to protect themselves from inability promptly to fill orders. Accumulation of these huge inventories caused them enormous losses when demand and prices so precipitously declined in the latter part of 1920.

It is interesting and gratifying to you, to know the facts show that to the improvement in railway operating and financial results that has occurred within recent years the purchases and stores departments have contributed fully as much in proportion as other departments. Fifty-seven per cent of the operating expenses of the railways are incurred for labor and 34 per cent for fuel and materials and supplies. The year 1925 is the latest for which we have detailed statistics of operating expenses. In that year the total labor cost charged to operating expenses was 23 per cent less than in 1920, there having been a reduction of about 13 per cent in the number of employees and also some reduction in the average annual wage. The reduction in the amount of labor employed, in view of the increase in the traffic handled, reflects great credit on those who made the capital expenditures and effected the improvements in operation by which it was brought about.

Also Greater Skill in Buying

It is interesting and significant, however, in view of recent advances in wages, and claims presented for others, to compare this decline in expenditures made for labor with the decline that simultaneously occurred in expenditures for fuel and materials and supplies. Spokesmen for organized labor say that what the railways are able to earn or the rates they are allowed to charge are not taken into consideration in determining what they must pay for equipment, fuel and materials, but that they have to pay the market prices, and that, likewise, railway earnings and rates should not be considered in fixing wages. Now, the facts show that such full advantage was taken of changes in market and other conditions by those responsible for purchases that the decline in operating expenditures for fuel and materials between 1920 and 1925 was as great as in those for labor. The total charges to operating expenses for fuel and materials and supplies in 1920 were \$2,041,000,000 and in 1925 only \$1,565,000,000, a decline of \$476,000,000, or 23 per cent, which was the same percentage of reduction that was made in operating expenditures for labor. These facts show that labor has not borne more than its share of the reduction of operating expenses, and also that relatively as much skill and efficiency have been used in

buying and using fuel and materials as in employing and directing labor.

In the purchases and stores departments of the railroads, as well as in the manufacturing and mercantile businesses of the country, a great deal of study has been given within recent years to the problem of reducing inventories. The total stocks carried by the railways reached their maximum in 1920, as a result of the high prices which prevailed, and amounted at the end of that year to \$755,563,000. This had been reduced at the end of 1925 to \$525,853,000, or about 30 per cent. Probably the best measure of the amount of stocks that should be carried is the rate at which they are turned over. There has been a marked improvement in this respect in the railroad business. In the five years ending with 1920 stocks averaged 43 per cent of the average annual charges made for materials and fuels to operating expenses, while during the five years ending with 1925 they averaged only 36 per cent, and in 1925 reached the low figure of 34 per cent. These figures are not an exact measure of the rate of turnover, because the stocks on hand used in computing them included those carried for capital expenditures, as well as for operating expenditures, and the annual rate of turnover was considerably more rapid than the figures imply. What they do plainly show is that the study being given to the handling of stores by officers of individual railways and by this division has been resulting in a substantial reduction of them in proportion to the total amount of fuel and materials used in making improvements and conducting operation.

Traffic as an Influence in Purchases

It is obvious the railways should follow a policy in making purchases that will constantly encourage the greatest possible initiative and enterprise in the railway equipment and supply industry, but sometimes influences are brought to bear on purchases that do not have this tendency.

One of these influences is that of traffic. Every concern that sells to railways is also a shipper that buys transportation from them. Some of them are large and some small shippers, and the former are naturally disposed to use the large traffic they can give as an argument in favor of purchases being made from them. A railway may naturally be disposed to favor a big shipper if he meets squarely and fully the competition of a smaller shipper with respect to price, quality and delivery. But unfortunately and inevitably there is often a tendency on the part of large concerns to insist that, in their favor, some or all of these considerations shall to a greater or less extent be disregarded because of the relatively large amount of traffic it can give.

Should Railways Engage in Manufacturing?

In the long run there is only one safe rule that can be followed with reference to traffic considerations. This is that they shall be disregarded unless the concern that emphasizes them is willing to sell equipment and materials on at least as good a basis of quality, price and deliveries as its competitors. When purchases actually do get traffic they merely divert it from one road to another, and the road that loses it can soon get it back in the same way, while purchases made squarely on the basis of price, quality and deliveries stimulate initiative, enterprise and competition in the manufacturing industry in supplying the railways with the best practicable equipment and materials at the lowest practicable cost, and therefore promote the efficiency and economy of railway operation.

A question to which an unusual amount of discussion

has been given within recent years is that of the extent to which the railways should manufacture equipment and materials for themselves instead of buying them. It relates to manufacturing all the way from the simplest forms of reclamation of scrap to the building of new cars and locomotives in railway shops. It is sometimes claimed that railways should refrain from manufacturing because it is no proper part of their business. That is a view which is not entitled to much weight. It is the duty of railway officers to develop, manage and operate the properties in such ways as will be conducive to the best operating and financial results, and when convinced that they can do manufacturing that will be conducive to these results, they will undoubtedly engage in it.

They should not, however, let themselves be convinced of this too easily. They will not be judged in the long run by the public according to the way they do manufacturing, but according to the way in which they furnish transportation. Some railways are so prosperous they can raise practically all the capital they may desire for both manufacturing and transportation purposes. Under our policy of restrictive government regulation, however, a large majority of railways constantly need more capital for the development and improvement of their transportation facilities than they can raise. It seems beyond controversy that a railway so situated should devote all the capital it can raise to the improvement of its transportation plant, and no railway can engage in manufacturing to any considerable extent without investing capital and utilizing valuable time of its officials for that purpose.

Furthermore, the accurate determination of whether a railway actually can do manufacturing more economically than it can buy requires that it should establish a very complete system of cost accounting and include in its estimates of cost an adequate allowance for practically every item of cost that the outside manufacturer must incur. The outside manufacturer must recognize

and pay every cost he incurs, whether he wants to or not, and if a railway that engages in manufacturing does not set up and recognize every expense incurred, including adequate allowances for every form of overhead, it is quite certain to deceive itself as to the results of its manufacturing operations and to be incurring losses when it believes it is making savings.

Should Have Full Knowledge of Costs

Undoubtedly the results would be enlightening and beneficial if railways and manufacturers would join in employing impartial experts to make studies of the comparative costs incurred by them in doing various kinds of manufacturing. Both manufacturers and railways know the prices the manufacturers ask, but nobody except the officers of individual railways usually know even the approximate costs incurred in manufacturing by railways. Until expert and accurate comparisons are made discussions of the subject will be inconclusive, if not futile, and there will be danger of expensive mistakes being made. To whatever extent the railways engage mistakenly in manufacturing they will not only incur direct losses, but also indirect losses by depriving the manufacturing industry of business which, if given to it, would enable it to carry on its production at lower unit costs.

I venture in concluding these somewhat general, and, as you may think, unpractical remarks, to utter a word of tribute to the work of the purchases and stores officers of our railways and of this association, which is deserving of the highest praise. The purchases made on behalf of our railways are enormous and inevitably afford, as all such large transactions do, opportunities of dereliction of duty for the promotion of the selfish interests of those who carry them on, but I venture the opinion that in no other large-scale industry in this country is buying done with more care or efficiency, or on as high a plane of honor and honesty, as in the railroad industry.

The Motorized Delivery of Materials



W. S. Morehead
Chairman

In gathering data the committee was divided into five sub-committees of three members each. These sub-committees were selected territorially and assigned groups of railroads in their respective sections. By this division the committee was able to visit 28 of the leading railroads in the United States and Canada and obtained written reports on five additional roads, the roads thus covered representing approximately 75 per cent of the mileage of all Class I railroads.

On the roads investigated the principle of organized store or shop delivery is recognized as a sound practice, although its application ranges from practically 100 per cent organized store delivery at some points to nothing at other points. The equipment used ranges from a two-wheel warehouse truck to locomotive cranes, with little progress in unified control. The organization for handling also varies from an organized handling force to the old method of shop men calling at the storehouse for their individual needs. This wide variation not only applies to practices on different roads but in many cases to different points on the same road.

Unloading from Cars

Material can best be handled to and from open cars by overhead, locomotive type, electric or gasoline type cranes, local conditions to govern as to which type is most suitable. Owing to the the various usages it is recommended that

the control of each crane be vested with the department requiring the greater portion of the time of the crane.

In handling material from box cars at platforms, lift platform trucks with skids are well suited for this work. This is particularly true of material stored in buildings or on platforms adjoining or adjacent to unloading platforms. In using lift trucks with skids it will often be found advantageous, where material is to be reloaded or delivered to the point for use within a short time, to allow material to remain on skids thereby saving two handlings. Certain items that come in and go out in quantities equal to a skid load may be left stored on skids thereby saving two handlings. Local conditions will, of course, determine to what extent this is advisable.

Tractors with large wheels and trailers should be used where the material is to be handled a considerable distance or where platforms or roadways are in poor condition.

Gravity conveyors can be used to advantage for the handling of lumber, brick and similar items where track arrangements are such that cars cannot be spotted in close proximity to storage piles.

Organization

This service should be in charge of a delivery supervisor who should report to the general foreman of the supply department. He should have an office centrally located, equipped with telephones and such office and other assistance required. However, small stores should understand that such organization and equipment is not necessary to put organized material delivery into practice.

In order to co-ordinate all the delivery and transport effort and to realize, from a general standpoint, the maximum efficiency and economics from the investment in power trucks, tractors, trailers, skids, improved roadways, etc., it is

recommended that all power equipment assigned to the plant for material transport in or out of the plant be placed under the supervision and direction of the delivery supervisor.

The plant should be divided into zones or sections, the size and number to depend on the volume of work performed and each of these zones assigned to a stock or zone man

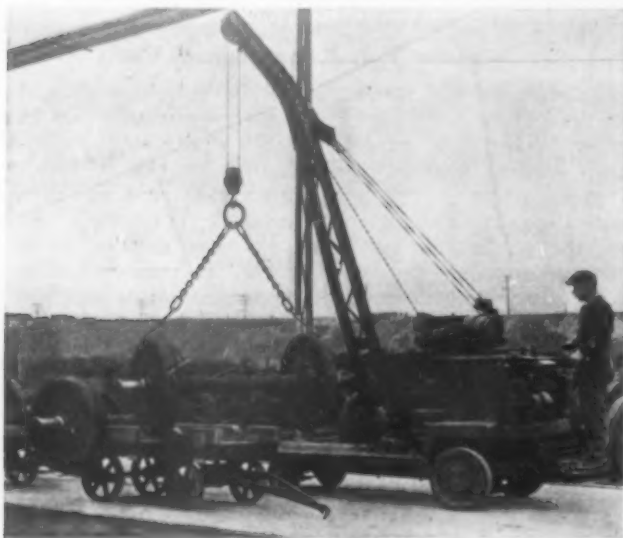
be cancelled from order and the foreman notified. Such items should be reported to the storekeeper for information in connection with replenishment of stock.

Orders for equipment for use in transporting material between shops, between shop and store, for moving of scrap or rubbish should be placed in order boxes from which they will be gathered by zone stockmen or truck drivers on regular trips and passed to delivery supervisor for handling.

Equipment

The equipment required will depend on the location of store with respect to shops to be served, conditions of roadways and platforms and volume and nature of material to be handled.

A light two-wheel hand cart or three-wheel wheelbarrow is well suited for light material; electric platform lift trucks



A Crane Truck Loading Wheels on a Special Trailer

who will report to delivery supervisor. It should be the duty of each zone man to patrol the zone assigned, gather all material orders and be responsible for delivery of material on these orders.

The number and duties of the various men assigned to this service, will of course, vary with the size of the plant and volume of business handled.

As a general rule heavy material handled by trucks, cranes, tractors and trailers or by lift trucks which cannot be loaded



Delivering Material as it Used to Be Done

with skids and tractors and trailers for heavy materials. Specially constructed trailers are desirable for certain items such as mounted wheels, tires, locomotive cylinders, etc.

Roadways

The more recently constructed shop and store plants have provided concrete roadways. It is the opinion of this com-



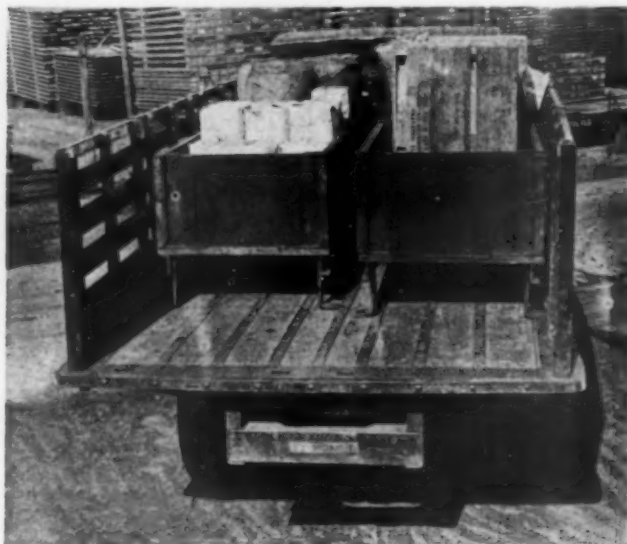
Using a Motorcycle in Stores Delivery

and unloaded by the truck driver without delaying tractor or truck should be loaded by the department making the shipment and unloaded by the department receiving the shipment, thereby saving travel time of men following truck or tractor.

Material Orders

Each zone should be provided with as many material order boxes as necessary to prevent excessive loss of time of foremen or men in depositing orders. There should be but one class of material specified on an order.

When the material ordered is not in stock, the item should



The Value of the Auto Truck Is Increased by Using Skids

mittee that concrete roads are preferable. The committee finds that considerable progress is being made in providing roads in some of the older plants. Good road construction should be constantly recommended by the stores department as much time in the delivery work will be saved, also less upkeep of equivalent will be required.

Direct Deliveries

Consideration should always be given to unloading material at the point of use. This is advisable only when the material is for specified work programs, and then only when received in carload lots and track facilities are such that material can be placed in the desired location direct from the car without extra trucking and handling. Material received in l.c.l. lots and not required for immediate use, should be unloaded and placed in the storehouse rather than reswitching car or trucking to point of use.

No system of delivery is complete without some method of determining its efficiency as compared with previous methods and as compared to performance one month with another. The investigation does not disclose any uniformity in keeping of such records at present.

Line Deliveries

Division VI is on record as approving the supply train method of delivering materials and supplies to line of road. This committee favors this method of distributing line materials with the exception, in some cases, of congested terminals and districts. The motor truck is well suited for this work and several roads have adopted its use. Trailers can be used in connection with this work fitted to suit requirements.

Committee: W. S. Morehead, (chairman), assistant general storekeeper, I. C.; J. V. Anderson, assistant district storekeeper, C. M. & St. P.; F. S. Austin, general storekeeper, B. & A.; M. E. Baile, division storekeeper, M. P.; R. G. Bensen, storehouse inspector, Erie; G. J. Fleisch, general traveling storekeeper, A. T. & S. F.; L. T. Hoffman, traveling storekeeper, U. P.; F. E. Huff, traveling storekeeper, N. & W.; R. R. Jackson, division storekeeper, Wab.; C. H. Kelly, district storekeeper, L. V.; C. W. Kinnear, assistant general storekeeper, Penna.; C. H. McGill, supply train storekeeper, N. Y. & N. H. & H.; W. E. Ruston, storekeeper, B. & M.; W. E. Rawson, district storekeeper, S. P.; C. H. Schneider, district storekeeper, C. R. I. & P.; C. C. Kyle (chairman ex-officio), purchasing agent, N. P.

Discussion

Through the courtesy of the Illinois Central a moving picture was shown of motorized material delivery in the Burnside shops near Chicago. L. I. King (I. C.) explained the views shown on the screen.

W. S. Morehead (I. C.), chairman, then presented the report. At this time Vice-Chairman A. S. McKelligon (Sou. Pac.), took the chair. Chairman McKelligon: We have seen a wonderful picture and Mr. Morehead has worked up some good data. This is about the only means we have left of reducing our payrolls, that is, keeping the material on wheels.

C. C. Kyle (Nor. Pac.): Since stores delivery was put into use roadways, sidewalks and runways in and about our shops are now under the supervision of the stores department. I want to emphasize the great importance of better highways around our shop properties.

Mr. Curtis resumed the chair.

M. E. Towner (W. Md.): What figures are available to show the maintenance costs and how quickly can the road pay the investment out of savings?

Mr. Morehead: The committee did not gather such data. The figures we have, however, indicate a saving of 15 to 25 per cent on the investment.

J. G. Stuart (C. B. & Q.): Motorized delivery is saving more money than almost any other thing we do and yet it is difficult to prove this, because the saving is hidden. Yet there is no question but that the savings are large.

Mr. Towner: Five years ago I desired to buy a locomotive crane and the president of the road said, "You can buy it if you show me savings. We paid for the crane in exactly 9½ months.

O. Nelson (U. P.): Considerable labor as well as gravel and cinders is expended in trying to keep up old shop roads. We should build concrete pavements in our shops.

W. H. Hopkins (Mo. Pac.): Within the last two weeks we authorized the purchase of two lift trucks. We expect a saving of about \$500 a month for each truck.

[A motion to accept the report was carried.]

The Purchase and Control of Materials

By H. C. Pearce

Director Purchases and Stores, Chesapeake & Ohio, Richmond, Va.



H. C. Pearce

The division of purchases and stores expends from 20 to 25 per cent of the gross revenue. It is fundamentally a service and business organization. Being essentially a service organization, it must be so organized that it knows and anticipates the needs of the using departments and meets them promptly.

The division of purchases and stores should be made responsible for the investment in materials and supplies, and in order to meet this responsibility, there must be an organization which can know sufficiently in advance the quantities and kinds of materials to be required and which can negotiate a judicious purchase, and transport the material to destination. This involves careful scheduling and planning of not only the work, but of manufacture and delivery.

Quality Determined by Users

The quality must be determined by the using departments well in advance of the needs, in the form of intelligent and clearly-drawn specifications, supported by practical and thorough tests. This will enable the chief

purchasing officer to broaden the market, negotiate the source of supply in advance of the needs and make such arrangements as may be necessary to take care of all contingencies incidental to the delivery.

The cost of material does not merely mean the price and handling charges. Nothing is cheap that is not needed or that you can get along without. The most important functions of the division of purchases and stores are to know that the need exists and that nothing is available which can be used.

The real problem of providing materials of proper quality, at the lowest price, when needed, depends entirely on the ability to know sufficiently in advance what will be needed and the quantities to regulate the requirements so that they will be received about the time they are required, and to supervise all expenditures for materials from the time authorized until actually used, in order that capital may not be tied up in that which is not required or which is not bringing in revenue. Broadly speaking, material balances should be reduced to material in transit.

It must be apparent that there is an inseparable connection between the purchasing and stores departments, and that the best results can only be obtained by coordinating these departments under a directing head, who will be responsible only to the chief executive.

Report on Purchasing Equipment



M. E. Towner
Chairman

Specialties are defined as those items which are patented, and in the main competitive, or not usually made by the equipment builder, for example: Injectors, bell ringers, hydrostatic or force feed lubricators, power reverse gear, etc. Each railroad should give serious consideration to the purchase of these items rather than causing the purchase to be made by the equipment builder. This will preclude the necessity of equipment builders securing prices on such specialties, and reduce the time necessary for the preparation and submission of their bids to the railroad. It will like-

wise relieve the equipment builders' estimates of the cost of such specialties, and at the same time reduce the cost of the equipment by the amount of the builders' profit that is usually added to the total material cost.

It is of distinct advantage in the purchase of specialties for equipment, such as locomotive cranes, wreckers, ditchers, motor cars, shop equipment and machinery, that a supporting repair part list be obtained when bids are submitted. Such lists furnish important and useful information, particularly bearing on replacement or maintenance costs.

Contracts

Whether the contracts be for the purchase of equipment, or designed to cover term periods for materials, it is quite essential that certain clauses be embodied as follows:

- 1 Material.
- 2 Specifications.
- 3 Quantity.
- 4 Price.
- 5 Terms of payment.
- 6 Place of delivery.
- 7 Time of delivery—penalty clause if necessary.
- 8 Inspection.
- 9 Title to equipment, or ownership, pending completion of payments.
- 10 Patent protection, covering both vendor and vendee.
- 11 Insurance.
- 12 Liability insurance.
- 13 Assignments.
- 14 Free transportation.
- 15 Personal injury clause where free transportation is granted, or where manufacturers' demonstrators are on railroad property.
- 16 Defective material—ownership and disposition of.
- 17 Guarantees suitable to the subject in hand, particularly applying to satisfactory performance.
- 18 Approved final drawings and specifications—materials to be furnished by railway and conditions attending.
- 19 Detailed drawings to be furnished by either party.

A synopsis record in loose-leaf form showing the essential items covered in each contract alphabetically arranged, including particularly the firm name, quantity, price, f.o.b. point, terms of payment, etc., is of distinct value in pricing and in keeping a record of renewal dates of contracts.

It is also recommended that contracts be filed in a regular contract file, alphabetically arranged, and free from extraneous or other correspondence not bearing on the terms of the contract.

Statistical Data

It is essential that every purchasing department keep up to date and have easily available, records of certain basic material prices. The information as to prices on basic materials, over a period of time, showing market fluctuations, is of value in considering the purchase of equipment as well as the purchase of basic materials, and in the purchase of commodities regularly affected by market conditions. The following items are suggested as among those which are of general interest:

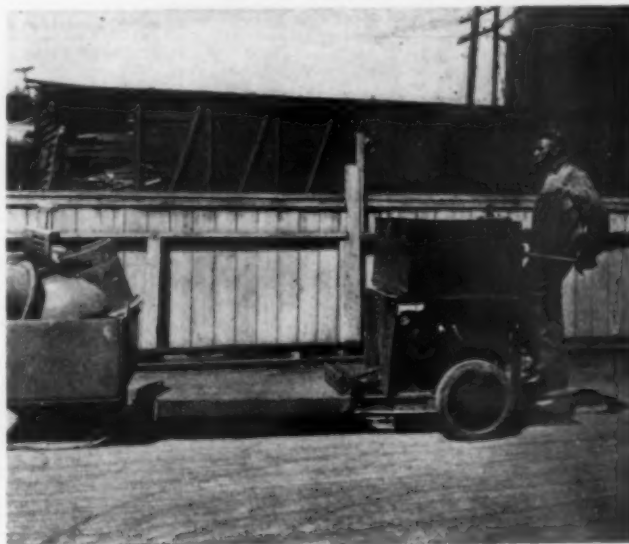
Pig tin
Pig lead
Antimony
Aluminum
Copper—Prime lake and electrolytic
Zinc
Pig iron
Steel bars
Steel shapes
Steel billets

Linseed oil, rubber
Crude rubber
Coke

Railroads should allow car builders as much time as possible to submit bids, endeavoring to allow a minimum of two weeks from the receipt of inquiry by car builder where one type of car is inquired for, with a further allowance of one additional day for each additional type of car. For passenger cars, which are more complicated than freight cars, efforts should be made to hold to a minimum of three weeks, with an extra allowance of two days for each additional type of car.

Inquiries should define clearly the basis on which the car builder is to prepare his bid. Specifications and drawings should be as complete and as much in detail as it is possible to make them. Where a railroad contemplates furnishing specialties at its own expense to the car builder, a complete list of such specialties should be included. Great care should be taken to see that no points in specifications and drawings are in conflict.

Requests for bids on specialties should be confined to a reasonable number of alternates. Having determined, prior



A Lift Truck Picking Up a Skid

to sending out bid requests, the acceptable alternates, the inquiring railroad should confine itself to a limit of not over three or four alternates, and less if possible, not making it incumbent upon the equipment manufacturer to canvass the entire field.

Close consideration should be given to requests for allowances, in that the list may be, in its entirety, as limited as possible. It should not include items which tend to complicate the equipment builder's bid. It is further recommended that in handling equipment inquiries, the purchaser should arrange the dates upon which specialties will be given consideration, so that the manufacturer interested may call on those dates. An unprescribed program keeps manufacturers' representatives waiting. The same recommendation applies to the letting date of the equipment units.

Committee: M. E. Towner, (chairman), general purchasing agent, W. Md.; J. L. Bennett, purchasing agent, C. of G.; G. W. Bichlmeir, general purchasing agent, U. P.; P. L. Grammer, assistant to purchasing agent, Penn.; P. Hunter, assistant purchasing agent, C. B. & Q.; W. H. King, Jr., assistant to vice-president, S. A. L.; H. M. Rainie, assistant to purchasing agent, B. & M.; T. H. Ryan, assistant purchasing agent, Wab.; G. H. Walder, purchasing agent, C. M. & St. P.; G. E. Scott, (chairman ex-officio), purchasing agent, M-K-T.

Discussion

L. F. Duvall (A. C. L.): A bill of material should also be included in important contract clauses.

M. E. Towner (W. Md.) chairman: It was mentioned but not embodied because we find that it is followed out to quite an extent.

[A motion to accept the report was carried.]

Stores Department Safety Practices



J. L. Irish
Chairman

The opportunity for accidents in the stores department or in handling materials and supplies is great, owing to the volume of various materials handled such as frogs, heavy billets, scrap materials, lumber, etc., also from the fact that the stores department at the larger shops are conducting reclamation plants in connection with scrap docks, delivering materials to the shops, supply train service, etc.

The foremost question in connection with safety practices is that of supervision. Supervisors must believe in, teach and practice safety if the desired results are to be obtained.

In the stores department the major injuries occur to the laborers. Constant and not spasmodic supervision is necessary to gain satisfactory results. When first entering the service an employee should be given to understand the importance of protecting himself and his fellow workers. He should also be instructed that when he accepts employment and remains in the service it is proof that he does so with a full knowledge of the danger in connection with railroad operation and that he agrees to exercise due care in the performance of his duty to prevent accident or injury to himself or others.

Unless foremen and other supervisors continually caution and instill safety in the minds of the men under their charge all the signs and posters that can be put up will be of little use.

At least one stores department representative should be on the shop safety committee. These representatives should be selected from the different classes and changed periodically. Where the stores department is of sufficient size to warrant a committee, such a committee should be organized, this committee to be composed of a representative of each class and its meetings to be held regularly at least every 30 days.

A committee composed of three employees to investigate all important accidents, will be found beneficial. This committee should be appointed by and report direct to the storekeeper in charge. The chairman should be a practical store department man and thoroughly in accord with safety, and also a man who has the confidence of the men under him and who makes the men feel free to make suggestions without being criticised or ridiculed.

In many stores department organizations are foremen and workers long in service who are energetic and tireless, but who in their earnest endeavors to get work done, fail to give the proper care and attention to safe methods. When they become enthused over safety the same tireless efforts will be exerted for safety in connection with their work.

Oil Houses

All oil houses should be protected by No Smoking signs posted in conspicuous places and the rule strictly enforced. All issuing, or broken, cans of gasoline, wood alcohol, and other inflammable liquids should be kept in safety cans. Ignition powders for thermit welding should be stored in fire proof boxes.

Where necessary to issue gasoline for fuel to trucks or tractors in containers it should be issued only in safety cans. All store employees, in and around oil houses and supply trains should be thoroughly familiar with the handling and transferring of inflammable liquids, as covered by Bureau of Explosives' Pamphlet No. 21-B. When cars of gasoline are to be emptied or transferred one man should be regularly assigned to and held responsible for this work.

All drums and barrels of gasoline or inflammables, as well as carboys or jugs of acid, should be carefully inspected for leaks before being turned over to the shipping department. In opening iron barrels of gasoline or other highly inflammable liquids they should never be hammered with a metal object as this would produce a spark which might ignite the contents. In case of empty carboys they should be carefully inspected, or better still, flushed with water, before being returned to the dealers.

No inflammable liquids should be placed in cans for shipment unless properly labeled. Under no circumstances should gasoline be placed in glass bottles, even for samples.

Shipping drums or barrels should never be emptied with air pressure. If a reducing valve is used there is always the possibility of mechanical failure.

If quantities of acid are to be handled the parties handling them should be furnished with rubber boots. In issuing acids or transferring carboys of acid, as well as in the handling of caustic

soda or other similar compounds, goggles should be used. An approved gas mask should be furnished and used in the cleaning of storage tanks being used for gasoline, kerosene and other less volatile oils. The transferring of acids should be assigned to one man and extreme care used to see that acids of different kinds are not mixed.

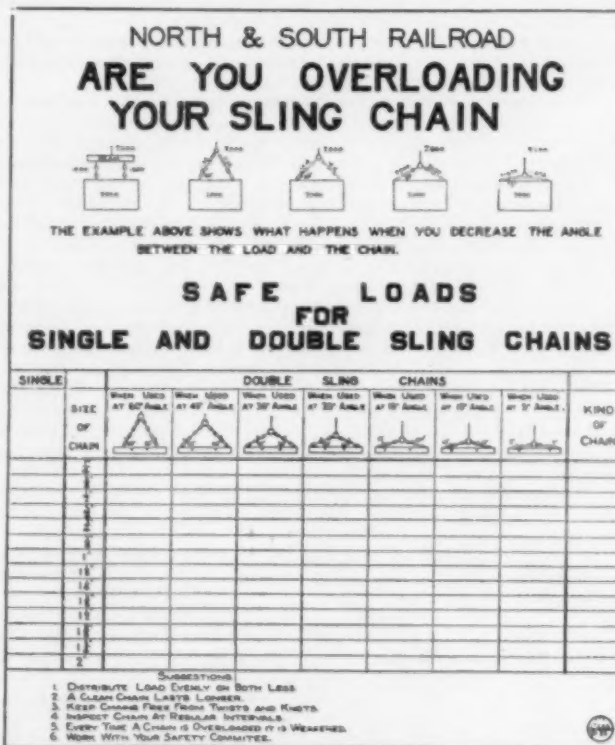
Rubber gloves should be furnished for the handling of acids, caustic soda and other similar items, as well as to protect the hands while moulding or forming rod cup grease and driving journal compound, which contain caustics.

Lumber Yards

At the larger terminals where car shops and mills are located the lumber yards require the service of a considerable number of men—both semi-skilled and laborers. Splinters, scratches, falling from piles, being struck by boards in the hands of fellow workers, and protruding nails in braces used in tying loads on open equipment, are the chief causes of injuries in these yards.

Tools such as bars, peavies, axes, dillies, rollers, saws, hammers, etc., should be given careful inspection.

While yards are being switched foreman should see that men are out of cars. Men working on top of loads, either in tying them or removing braces and tie boards, should never throw tools or boards from cars without seeing that all is clear. Tie boards



danger of particles entering the eyes. Where there is danger of flying particles striking other workers nearby, an old broom, portable shield or burlap held around the work. Autogenous cutters should be provided with leggings to protect them from hot metal.

When unloading scrap from box cars warning signs should be placed at the ends of the cars to prevent laborers or others from passing between the car and the pile that has been unloaded.

In case of breaking up large castings, such as cylinders, deck castings, wheel centers, etc., with locomotive crane and skull-cracker, extreme precaution must be used to prevent pieces from striking other employees or the crew doing the work. Equipment should be in first-class condition, special attention being given to the trip to prevent accidental drop of the skullcracker.

Reclamation

Reclamation plants should be in charge of a practical man with a thorough knowledge of machinery and mechanical devices.

Under no circumstances should defective tools be tolerated. Care should be used to see that no ragged, loose or greasy overalls or jumpers are worn as they are liable to be caught in moving machinery or catch fire.

Material should be kept clear of established aisles and away from machines. Tools when not in use should be returned to their places.

Cutting compound should be treated with antiseptic to prevent infection to the men operating the machines.

No belts should be shifted while the machines are in motion unless provided with a mechanical shifter. No attempt should be made to clean machinery while in motion.

In case of repairs to the shafting, belts, etc., the fuses should be removed from the motor or starting box and protected with a suitable sign to insure others not starting the line shaft.

All machinery should be regularly inspected by the mechanical department machine foreman, or his regularly appointed inspector. The reason for naming an inspector from the mechanical department is that these men are continually looking over the machinery in the shops and have a thorough understanding of the rules and regulations covering the handling of them.

Grinding wheels should be inspected daily to see that window glasses are kept clean and wheels are properly dressed and running true. Goggles should be worn by all using grinding wheels, regardless of the window guard over the wheels. This for the reason that in many cases it is necessary, due to the shape of the piece to be ground, to throw back the window guard. Goggles should also be used when operating power hammers used in straightening bolts and spikes, by parties required to operate rattlers and by parties straightening bolts, or similar items by hand, also by any employee required to do buffing or cleaning on a power driven wire brush or buff. In reclamation work there is more danger than in using new material, for the reason that the material reclaimed is rusty.

The wearing of gloves while working around revolving spindles such as tapping machines, bolt threaders, etc., should not be tolerated.

In the dismantling of cars and locomotives, when done at the reclamation plant, the foreman should thoroughly outline how it is to be done.

Shipping Gangs

The hazards in connection with receiving and shipping due to the various commodities handled are many.

Special attention should be given to the inspection of containers of inflammable liquids, acids, fire works, and gases and to see that they are properly loaded, stowed and braced in accordance with Bureau of Explosives' rules and regulations. Any packages offered with nails protruding or improperly wired should be refused and Foreman's attention called to it. All cars before being loaded should have protruding nails pulled, not only to protect the freight, but the men as well. Blocking and bracing should be kept picked up and put in a regular place provided for same.

Trucks should be constructed that small loose materials or packages will not fall through on trucker's feet. Too much stress cannot be placed on the safe handling of heavy articles with bars and rollers.

A convenient and safe place should be provided for tools and men should see that they are returned to their places when through with them.

Suitable extension cords should be provided so as to furnish good light on the inside of cars while being worked. This is very important.

Laboring Gangs

These gangs are to a great extent composed of temporary or transient laborers and in some districts foreigners unable to understand the American language.

Special attention should be given to the new man. Where a man is found taking a chance the work should be stopped and the

man corrected. This will make an impression on the rest of the gang.

In handling coke, fire clay, sand, and similar items when the sand is blowing men should wear goggles, suitable for their work.

Care should be used to see that tools when not in use are in a safe place and not thrown on the ground where men are liable to trip over them.

Older men in service accustomed to doing things in a safe way should be placed in each gang where practical.

Gang planks should never be left protruding from cars, even while being temporarily switched.

Inclines on which hand trucking is done should be cleated to prevent slipping. Old air brake hose securely nailed at the ends do very well for this purpose. Inclines should also be equipped with a guard rail to act as a brake. A rule should be made and rigidly enforced that all men going down inclines with loaded trucks go down behind the truck.

Keep material from tracks and passageways. Sufficient men should be provided to handle heavy material that is difficult to handle.

Foremen should be careful before starting to work on cars to see that they are protected with a blue flag or suitable sign.

Supply Train Service

When unloading frogs and other similar and heavy material the men doing it should understand how and have a regular assigned member of the crew supervise the work. The distribution of ties, bridge timbers and piling requires experienced men and the most careful supervision. One of the most dangerous commodities to unload is poles, or piling.

It is often necessary to load package and similar material in box cars, which necessitates climbing. In many cases improvised ladders are made from boards and nailed on to the cars. This is a dangerous practice and should not be tolerated. A supply of ladders made from light angles and grab irons should be kept for such cases.

Division or supply train storekeeper should see that no member of the crew attempts to get off before the train has stopped. As crews usually are composed of young and active men the temptation is strong for them to show their ability to get off while the train is in motion.

Rushing the loading of scrap while officials are waiting is a poor practice. Too much haste tends to carelessness. Loading couplers or heavy articles by hand should be done with sufficient help as the lift is high and the strain great.

The use of oil lanterns on supply trains should be forbidden.

Pointed or edged tools such as picks, chisels, adzes, mattocks, saws, scythe blades, etc., as well as lining bars, should be carefully placed—not thrown—in tool houses so they will not be stepped upon or kicked. Never throw anything from cars.

One man should be assigned to and see that no movement of train is made unless signal is given by him. This should be strictly enforced and under no circumstances should the train start from a station until all are on board.

Locomotive Cranes

Cranes are the most useful machine in the stores department if efficiently handled.

Foremen and crane engineers should be required to pass an examination on the rules which govern signals and movements of engines and cars. This is necessary where the cranes are working in conjunction with yard switch crews. Care should be used to see that cars while being pushed by the cranes have a member of the crew in a conspicuous position at the front of the leading car. Where loading and unloading requires movement in both directions the rear car should also be protected. Each member of the crew should be regularly assigned to his duty and thoroughly understand it.

The engineer should not permit any one not authorized to operate the machine. When crane is operating magnet, workmen should not under any circumstances stand under or near the magnet. In unloading scrap from cars to scrap dock, scrap must be kept at least six feet from the nearest rail. The crane should be equipped with locomotive bell and if the crane is standing the bell should be rung before moving. All cranes should be properly protected with steam whistle and its use governed by operating department rules in giving signals.

In loading wheels with a crane, where a magnet is not available a bar of sufficient strength (at least 2¼ in. in dia.) and grooved around the ends, into which flat loop rings attached to each end of chain or cables can fit, should be used. It is practical to load six wheels at a time in this manner. In loading wheels with such a bar it is necessary to tip the six wheels to the front so the chain or cable can be placed over the end of the bar. To make this operation safe, a bracket type frame of angle should be furnished, the rear of the frame to have spurs to prevent slipping, and the front of the bottom angles should extend under the first wheel to prevent bracket from raising.

Material must be piled in regular order not less than 10 feet from the nearest rail except in territories where locomotive cranes operate, where material should be piled not less than 15 feet from the nearest rail, in order to allow crane to operate,—never between passing and main tracks, or upon public highway. When stone or other material is unloaded, it must be immediately moved a sufficient distance from the track to avoid damage thereto or to trains.

All chains or cables should have the constant inspection of the crew while using them, and should be given a thorough inspection at least once a week for worn places, flaws or cracks. Each chain should be inspected monthly by the regular assigned shop supervisor, where they have such a position. Chains should be numbered and annealed at least once every six months. A record should be maintained of the last date this annealing was done so as to insure the annealing to be done at regular periods. Only the best quality of chain should be used for all slings.

Use short links for hoisting, as they will wrap closely around drums without risk of bending.

Exhibit "A" is a form showing what happens when the angle between the load and the chain is decreased. On this chart no figures have been shown because of the many kinds of chain furnished by the chain manufacturers. The committee recommends that such a chart be adopted and figures inserted, based on the recommendations of the manufacturers of chain being used. These charts should be placed in the hands of every foreman or engineer using such equipment.

Hoisting Operations

One railroad is using spreader bars of various types to handle hoisting work more efficiently and safely. One type is designed for unloading large timbers of the same length two at a time, for example: bridge stringers are stored on edge. Invariably they are received on open cars loaded flat. The spreader is made from two sizes of pipe. The end pieces telescope over the center piece, which is drilled with holes through it, into which pins are placed with large washers between the pins and ends of pipe working against them. The cables attached to the large ring on crane hook have rings in the ends into which the small hooks on the short cables fasten. The spreader is adjusted to the desired length and serves only to keep the cables apart. As the cables tighten the pipes are pulled out instead of being compressed. The four large timber hooks are then fastened just inside the center of the timbers and when raised the timbers stand on edge. Thus they can be placed against each other on the pile which ends even.

Another type is made from 60 lb. rail for handling sling loads of lumber and sills. The cables, attached to a large ring working from the crane hook, are fixed to the ends of the rails and double hooks over which the sling loops hook, are also secured to the rail. Through the large ring is also fastened a cable hanging down and furnished with a hook. This hook is to lift the ends of the timbers in order to place the cable slings under it. In unloading, a chain is worked in between the ends of a number of pieces. This end is then lifted high enough so that the two sling cables can be placed under them. The lift is then lowered, chain removed, cable loops placed over the hooks on the ends of rail and lumber or sills are unloaded without a possible chance of a piece shooting out as in many cases where only a choker hook is used.

Another type is used for handling frogs. This is made from 4 in. pipe, having a steel cap over each end with an eye on the top and the bottom. Cables from the large ring over the crane hook are fastened in the top eyes and rail tongs in the lower eyes. This keeps the tongs spread and eliminates the use of dragging chains out to the ends of frog to hook them.

In making heavy lifts extreme care should be used to see that outriggers are used where the crane is so equipped and ground men should watch for the least sign of wheels leaving the rail. Engineers of cranes should never attempt to swing the boom while traveling.

Automotive Equipment

This equipment should be divided as between the auto-truck and tractor and trailers.

The auto truck in most cases is assigned to main driveways, city streets and highways.

The auto truck driver must be a thoroughly reliable man for the reason that, while he is governed by the traffic laws when on the highway or city streets, nevertheless he does not come as much under the observation of the supervisors as does the tractor driver. He should comply with traffic rules literally and should stop at all grade crossings, stop signals, etc., thus being an example to the public.

The tractor driver should ever be on the alert to protect the other fellow:

The store delivery foreman should make it a point to see that he receives a copy of safety letters, bulletins and literature pertaining to safety work.

Machines should be under control at all times and the greatest of care used when working on shipping platforms and in, around and thorough store or shop buildings, as employees are liable to step from doorways, around corners, machines, etc. Each machine should be provided with a horn. Where necessary to cross tracks in switching districts, a pilot should be furnished or machines come to a full stop so there will be a clear view of the track to be crossed.

Tractors when pushing cars should have an employee in a conspicuous position at the front of the leading car. In pulling cars the tractor should not be chained in such a manner that it cannot be released quickly, as in case the engine stalls after the car is in motion. In some cases it is necessary for the tractor to push trailers, same being steered at the front by other employees. Such steering should be done with a long hook—never by hand. Tractors should be equipped at both ends with a heavy sheet metal bumper, at least in the rear, so as to protect the driver from being struck in the back in handling bar iron, pipe, long timbers, or similar items.

Drivers should not spot or leave trailers in passageways or fire roads. They should not leave their machines with the engine running while on platforms, inclines or in congested districts. They should also refuse to move a load unless it is properly loaded. It is the duty of the driver to see that no unauthorized parties ride either on the tractor or trailers. Drivers should not permit any one to operate their machines while they are on duty.

Inclines where tractors and trailers operate should have a slope of a not greater proportion than one to eight. They should be provided with a guard rail on both sides, if open, in case of accident or trailers breaking loose. A rail placed on its side with the base inward makes a very good guard rail for this purpose. In the winter, such inclines should be covered with heavy netting where the wheels run so as to give traction.

Safety Devices

There are in use on many railroads devices which, while not reducing the number of laborers, add to safety in handling materials. Some are manufactured in the open market. Others are made in railroad shops and reclamation plants.

A special truck for handling rail to and from storage piles is practical. This truck is similar in principle of action to the claw bar, excepting the claws are forks. At the heel is a double flanged roller that runs on the ball of the end skid rails, two being required to operate efficiently. A rail is skidded from the car to the pile. A man at each end places his truck on the skid rail, raising the handle and pushing the forks under the rail to be moved. The handle is then lowered, which places the weight on the double flanged roller at the heel. The rail is then pushed along the skid rails providing the track. The rollers on the forks allow the rail to be moved endwise in either direction. Two men are able to handle rail with ease.

Rollers, conveyors and chutes are now generally on the market. These not only increase the efficiency, but the safety as well. Hand and power elevator pilers are also now being used extensively, conserving floor space and operating efficiently.

One railroad is using a cradle for handling scrap tin, tinware, wire, etc., from scrap dock to dump. This cradle is constructed of two 30 ft. lengths of 56 lb. rail as side pieces and one by six boards as slats laced in place with a scrap cable, the ends of which are fastened around the rails, forming a large net. This cradle is held in position when at the scrap dock by posts set in the ground at the ends of rail. As fast as the tin, wire, etc., is sorted from scrap it is placed in the cradle. When filled the crane picks it up with four chains and loads it in a gondola car. It is then switched to the dump track and is dumped by merely loosening the two side chains. This not only saves the hand labor, but eliminates the injuries from cuts and scratches.

Another railroad has in use an ingenious apparatus for unloading loose cast iron wheels, which eliminates placing shock timbers or requiring the use of long gang planks. It is operated by gravity, having a band brake. It has a wooden frame, wedge shaped, approximately 8 ft. high and 4 ft. wide, with a leg spread of approximately 4 ft. On the apex is a shaft having a drum about 6 in. in diam., with a brake drum approximately 12 in. in diameter. On the front is a carriage, made from $\frac{1}{4}$ in. sheet, with a lip turned at right angle, on to which the wheel to be unloaded is placed. This carriage operates against wrot friction straps behind it. Two cables are attached to the top, one operating around the drum on each side of the brake drum. To this drum is also attached by a cable a counterweight heavier than the carriage. A lever and crank controls the brake from the back side where the operator stands. The brake is released, the carriage travels up to car floor height, the brake is then applied, the wheel is then placed on the carriage, the brake eased off and wheel is lowered to the platform by its own weight. The frame on the carriage side is mounted on a pair of wheels with a crank axle and lever so that when the lever is pushed down and fastened the frame is clear of the platform. The front wheels also raise the

frame when the tongue is lowered, making the outfit portable. This can be used to good advantage where the storage space is limited and no depressed tracks are provided.

The same railroad has a small hand operated piler for handling kegs of nuts, rivets or any loose items which can be loaded on the carriage. It will hoist to about 7 ft. and is mounted on four casters. The frame clears the floor $\frac{3}{4}$ in. When in use wooden wedges are placed beneath the frame on the floor, thus making it rigid. It is operated with a drum and crank similar to a wood lift. The cost is negligible and same can easily be made in reclamation plant or blacksmith shop.

Practically all wheel and axle platforms have a truck of some kind for picking up individual axles. A practical one has the usual inverted drop axle and long handle. On the end of the handle is an oblong collar that operates between the top ends of the tongs which carry the axle. There is a fixed leg attached to the tongue, having a fork on the lower end that fits the contour of the axle to be moved. The oblong collar is so keyed to the handle that when the tee of the handle is vertical the oblong collar is in the same position, allowing the tongs to open.

Committee: J. L. Irish, (chairman), general storekeeper, O. W. R. R. & N.; H. R. Duncan, inspector of stores, C. B. & Q.; W. J. Diehl, purchasing agent, M. & O.; G. W. Hanegan, general storekeeper, M. & St. L.; W. F. Merritt, traveling storekeeper, B. & M.; A. S. McKelligon, (chairman ex-officio), general storekeeper, S. P.

Discussion

A motion picture was shown illustrating safety practices in the shops of the Southern Pacific.

E. W. Peterson (Bangor & Aroostook): In breaking No. 3 cast iron with skull cracker, we find it is very difficult to prevent small pieces from flying and causing personal injury. We blow a whistle on the locomotive crane and require the men to get behind the wrecking crane.

J. L. Irish (O.-W. R. & N.): We have practically the same arrangement. The only man near the operation is the crane operator.

Mr. Peterson: We had an injury to a mechanical department employee who did not know what the whistle meant. He was struck by a piece of cast iron weighing about two pounds which had flown more than 100 ft.

Mr. Irish: We post a man to watch the runways or shop while the breaking is being done. Usually the breaking is done late in the evening, and we have had no injuries.

[A motion to accept the report was carried.]

The Public Has an Interest in Wage Arbitrations

By John M. Glenn

Secretary of the Illinois Manufacturers' Association



John M. Glenn

In genuine labor union style, following a long line of precedents in which courts and legislative bodies have been used to attempt to gain an advantage, the railroad arbitration board on the morning of May 16 informed Colin C. H. Fyffe, general counsel for the Illinois Manufacturers' Association, that he could not file an intervening petition on behalf of his client, constituting in part at least, the public. The

matter under consideration by the board was the petition of the railroad trainmen of the western carriers for a $7\frac{1}{2}$ per cent increase in wages.

Mr. Fyffe appeared for the Illinois Manufacturers' Association. Its membership includes the largest shippers of freight in the country. It is one of the best known organizations and in many respects one of the most important organizations in the world having to do with industrial affairs. Many of its members whose main offices and headquarters are in Illinois have branches in other states and a considerable number has branch plants in foreign countries. In other words, its influence encircles the globe and it is a world-wide institution.

Mr. Fyffe's request was simple. His client wanted to become a party to the proceeding for the reason that it feared an advance in wages, if allowed, would mean an increase in freight rates because the carriers would have to look to the shippers to supply the money to cover the great increase in cost in operating expenses. Mr. Fyffe, metaphorically speaking, was shown the door.

The chairman of the arbitration board handed down the opinion promptly and stated that counsel had advised the board that there was nothing in the statute under which the board was created authorizing it to consider any parties to the proceeding except the executives of the roads and the employees.

Brotherhoods Cannot Stand Alone

I want to show how the brotherhoods will grab any kind of a judicial or legislative straw; how they have leaned on various kinds of posts, used canes and crutches until they have reached a point where they actually cannot stand alone. It is a sad commentary. Legislative lobbies are maintained in Washington and at every state capital of the country, the purpose of which is to direct legislation, which if enacted will give the members of labor unions an advantage. Note what I say, "the members of labor unions," not wage earners as a class or wage earners in general.

The employers of the country, including practically all branches of business, have been forced to run to Washington and to the capital of the state in which they are located for their own defense and oppose every kind of a legislative whim imaginable. Just as able and just as eminent counsel advised the Illinois Manufacturers' Association that the board had authority to permit us to intervene.

Are They Afraid of the Public?

Are these mighty brotherhoods rich in organization and rich in this world's goods with their banks and coal mines, afraid to sit in conference with the public and have their case considered on its merits? Are they fearful that the wage earners of some other line of industry can make out as good a case as they can? Did it ever occur to you what would happen if the workers of every other line of endeavor were as well organized as the men who operate the railroads? I have no criticism to direct against the men who conduct the detail in connection with the railroads. It must be borne in mind, however, that the carriers have no cinch. They cannot give out the passes to legislators they used to hand out or chalk the hats of big shippers.

The days of competition have come. The evolution is on. The gasoline age is here; it is cutting in on railroad transportation right and left, and it does not require an expert to bring it to our attention. Every man can see it and you are the men who get the picture first. The brotherhoods had better prepare for

it. They cannot stem the tide by taking refuge behind threats or by giving the public a kick on the ankle. The automobile bears the same relation to the railroads that the direct primary does to the politician. Every man under the primary system is king of all he surveys. In transportation now every man is his own engineer and he can go where he pleases and he does not have to own and pay taxes on his right of way. The government builds his track and it builds him a good one and all he has to do is to vote bonds at every general election. He gives no thought to the morrow—lets it take care of itself. Let the brotherhood man wake up.

How Long Will the Farmer Stand for It?

Just how long the farmer will stand for artificial costs injected into the prices of the things he buys and the proportion of the burden he is forced to bear remains to be seen. He has quite a reputation for being a kicker. There are more people engaged in the agricultural business than in anything else and when the farmer gets thoroughly aroused the brotherhoods will have to take a back seat, rich as they are. The present farmer disaffection which arises from a cause entirely separate from that which we are discussing will look like the overflow of Salt Creek as compared with the Mississippi river rampages when the farmer gets thoroughly aroused.

I think the brotherhood man can teach us all a lesson, however. He is a money maker. I have a statement, which although it may be a little old, I have no doubt reflects the situation today even if it was made by Wil-

liam P. Prenter, the president of the Brotherhood of Locomotive Engineers, over a year ago. It is this:

"Five years ago the Brotherhood of Locomotive Engineers opened its first labor co-operative bank at Cleveland. Today it has banks in Boston, New York City, Philadelphia, Portland, Tacoma, Seattle, Birmingham and Minneapolis. Resources have expanded from \$653,000 to assets of more than \$150,000,000."

I have heard that only 15 per cent of the deposits belonged to the brotherhood and other labor organizations. I have often wondered if any considerable portion of the deposits were by manufacturers and if the railroads favored these banks by keeping "inactive" accounts in these institutions as compared with deposits "on tap." Something must have happened to stimulate such an active growth in five years.

Mr. Prenter makes this observation:

"To my mind the remarkable feature of labor banking is the fact that it is a bridge between capital and labor; between those who contribute the necessary money, machinery and materials to produce goods and those who do the actual manual labor of production and transportation."

Tremendous power is lodged in the officers who control the various transportation brotherhoods, but it is true, probably, that the public has enough strength to resist their united demands if it can be organized in an effective way. It takes the public so long, however, to become aroused that the situation resembles the old-time saying: "Locking the barn after the horse is stolen."

Scrap Handling and Reclamation



G. W. Lieber
Chairman

The sub-committee on scrap classification met in Chicago with The National Association of Purchasing Agents, the Scrap Dealers' Association and a representative of the Department of Commerce, using a report of the National Committee on Metals Utilization and the A. R. A. Scrap Classification as a basis of comparison in compiling a railroad classification to meet the requirements of dealers and industries, as outlined in the report of the National Committee on Metals Utilization, effective July 1, 1926.

The committee reviewed the requirements of rolling mills, iron and malleable foundries, blast, open hearth, acid open hearth, electric furnaces and Bessemer converters; likewise, the requirements of dealers, and recommends the following:

Proposed A. R. A. Scrap Classification

1. Arch bars, iron—Railroad arch, transom and tie bars, and coupler yokes.
2. Axles, steel—Solid car and locomotive, 5% in. dia. and over at center. Free of axles with keyways between wheel seats.
3. Axles, steel—Solid car and locomotive under 5% in. dia. at center.
4. Axles, steel—Hollow bored.
5. Axles, iron—Railroad car and locomotive axles, A. R. A. and M. C. B. sizes. Free from defective or imperfect forgings.
6. Angle and splice bars—Fish plates and patented joints, iron or steel.
7. Boilers—Fireboxes and tanks, uncut—all kinds, attached or separate. Specify whether with or without flues.
8. Boilers, fire boxes and tanks, cut up—Iron or steel boiler or tank plate cut into sheets and rings, with or without staybolts.
9. Bolsters and side frames—Cast steel.
10. Busheling, No. 1—Clean iron and soft steel pipes and flues, tank and bands No. 12 gauge and heavier, steel-plate punchings and clippings, soft steel and iron forgings

and flashings. No dimension over 8 in. To be free from burnt material, hard steel, cast, malleable and metal-coated material of any kind.

11. Busheling, No. 2—Netting, sheet and similar light material lighter than No. 12 gage. No dimension over 8 in. To be free from hard steel, cast and metal-coated material of any kind.

12. Cast, No. 1—Cast iron scrap, such as columns, pipes, plates, and castings of miscellaneous nature, but free from stove plate, brake shoes and burnt scrap. Must be cupola size, not over 24 by 30 in., and no piece to weigh over 150 lb. Must be free from foreign material.

13. Cast, No. 2—Pieces weighing over 150 lb., but not more than 500 lb. Free from burnt cast.

14. Cast, No. 3—Pieces weighing over 500 lb.; includes cylinders driving wheel centers and all other castings.

15. Cast, No. 4—Burnt cast iron scrap, such as grate bars, stove parts and any miscellaneous burnt scrap.

16. Cast iron brake shoes—Driving and car brake shoes of all types except composition filled shoes.

17. Couplers and knuckles—Railroad car and locomotive steel couplers, knuckles and locks stripped clean of all other attachments.

18. Frogs and switches, uncut—Steel and iron frogs and switches that have not been cut apart, exclusive of manganese.

19. Flues, wrought iron and steel—2 in. and 2 1/4 in., 8 ft. long and over, rattled.

20. Flues, wrought iron and steel—5 in. and over, 8 ft. long and over, rattled.

21. Flues, tubes and pipe—Wrought iron and soft steel. Must be free from dirt, excessive corrosion or lime and riveted seams. Fitting attached permitted.

22. Lined iron and steel—All kinds of material from interior of boilers, except flues which are encrusted with lime, such as crown bars, crown bar bolts, staybolts, etc.

23. Malleable—Malleable parts of automobiles, railroad cars, locomotives and miscellaneous malleable castings. Must be free from steel and cast iron parts.

24. Melting steel, No. 1—Steel scrap 1/4 in. and over in thickness, not over 18 in. in width, and not over 5 ft. long. Individual pieces must be cut into such shape that they will be free from attachments and will lie reasonably straight in a charging box. Cut boiler plate must be practically cleaned of lime, free from staybolts and not over 3 ft. long.

Smaller dimensions of scrap may be furnished upon mutual agreement between buyer and seller. May include structural shapes, plates, rods and bars $\frac{1}{2}$ in. and heavier, steel castings, heavy chain, carbon tool steel, heavy forgings, forged butts and similar heavy material. This grade may also include new mashed pipe ends, original diameter 4 in. and over, thoroughly flattened, sheet bars, billets, blooms, rail ends, railroad steel and wrought scrap, such as angle and splice bars, couplers, knuckles, drawbars, cut cast steel bolsters, coil and leaf springs, all coil springs to be $\frac{3}{8}$ in. or larger. No needle or skeleton plate scrap agricultural shapes, annealing pots, boiler tubes, grate bars, cast iron, malleable iron, or curly or unwieldy pieces will be accepted. Must be free from dirt, excessive rust or scale or foreign material of any kind.

25. Melting steel, No. 2—Plate scrap, such as car sides $\frac{1}{8}$ in. to $\frac{1}{4}$ in. in thickness. Punchings $\frac{1}{4}$ in. and over in thickness, heavy clippings, new unmashed pipe ends under 4 in. in dia., and similar material. Car sides and all light plate to be sheared 15 by 30 in. or under and all light rods to be 12 in. and under in length. Any curved or twisted pieces must be sheared into such shape that they will lie reasonably flat in a charging box and not tangle in handling with a magnet; all to be free from cast iron, malleable iron, burnt scrap, dirt or foreign material of any kind. Maximum size 15 in. wide by 3 ft. long.

26. Rail, iron—Standard section tee rails, original weight 40 lb. per yard or heavier; free from frog, guard and switch rails.

27. Rail, steel No. 1—Standard section tee rails, original weight 50 lb. per yard or heavier, 5 ft. long and over. Suitable for re-rolling. Free from bent and twisted rails, frog,

37. Tires, No. 2—All tires not included in Class 36, cut or uncut.

38. Turnings, No. 1—Heavy turnings from wrought iron and steel railroad axles or heavy forgings and rail chips, to weigh not less than 75 lb. per cu. ft. Free from dirt or other foreign material of any kind. Alloy steel scrap may be excluded from these specifications by mutual agreement between buyer and seller.

39. Turnings, drillings and borings, No. 2—Cast, wrought, steel and malleable iron borings, turnings, and drillings mixed with other metals.

40. Wheels, No. 1—Cast iron car and locomotive wheels.

41. Wheels, No. 2—Includes all kinds of built up or steel tired wheels 36 in. and under. Specify kind.

42. Wheels, No. 3—Solid cast steel, forged, pressed or rolled steel car and locomotive wheels, not over 36 in. dia. Specify kind.

43. Wrought iron and soft steel No. 1—Heavy wrought iron and soft steel from railroad shops and cars, 6 in. and longer, including iron links and pins. Flats $\frac{1}{4}$ in. thick and over; rounds and squares $\frac{3}{8}$ in. thick and over. Free from any riveted materials.

44. Wrought iron and soft steel, No. 2—Wrought iron and soft steel scrap from railroad shops and cars, under 6 in. long. May include tie plates, track bolts, spikes and nuts. All to be free from steel shapes and plates.

45. Destroyed steel cars and locomotive tenders—Includes underframes and bodies of steel cars cut apart sufficiently to load; excludes trucks and cast steel underframes. Specify kind.

46. Aluminum.

47. Brass, No. 1—Locomotive bearing, metals, such as



The Locomotive Crane Is a Source of Economy in Scrap Handling

switch and guard rails, or rails with split heads and broken flanges.

28. Rail, steel No. 2—Cropped rail ends under 3 ft. long, 50 lb. and over standard section.

29. Rail, steel No. 3—Standard section tee and guard rails, not less than 36 in. long; to be free from frog and switch rails not cut apart, and contain no manganese, cast welds or attachments of any kind except angle bars. Free from concrete, dirt or foreign material of any kind.

30. Sheet scrap No. 1—Under $\frac{1}{4}$ in. thick, consisting of cut stacks and stack netting, hoops, band iron and steel, pressed steel, hand car wheels, scoops and shovels (free of wood), and wire rope. Must be free from burnt or metal-coated material, cushion and other similar springs and lime-encrusted pipe and flues from boilers.

31. Sheet scrap No. 2—Includes netting (other than stack wire) and galvanized or tinned material, composition brake shoes and gas retorts, and any other iron or steel material not otherwise classified.

32. Steel, high speed—Specify kind.

32. Steel, manganese—All kinds of manganese, rail, guard rails, frogs and switch points, cut or uncut.

34. Steel, spring—Coil and elliptic made of material not less than $\frac{3}{4}$ in. dia. or $\frac{1}{4}$ in. thick, not over 18 in. wide. May be assembled or apart.

35. Structural, wrought iron and steel uncut—All steel or steel mixed with iron from bridges, structures and equipment that has not been cut apart; may include uncut bolsters, brake beams, steel trucks, underframes, channel bars, steel bridge plates, frog and crossing plates and other steel of similar character.

36. Tires, No. 1—All locomotive or car tires 36 in. and over inside diameter, smooth inside, not grooved for retaining rings or lipped. Cut or uncut.

driving crown and rod brass. Free from white metals, excluding car and tender bearings.

48. Brass, No. 2—Steam metal brass, including valves and fittings, injector and lubricating bodies and parts and check valves.

49. Brass, No. 3—Journal bearings free from babbitt.

50. Brass, No. 4—Brass or bronze borings, drillings and turnings.

51. Brass No. 5—Yellow brass castings, including coach trimmings, light brass, hose couplings, pipe, tubes, etc.

52. Copper, cable, insulated—Specify kind.

53. Copper, No. 1—Wire free from insulation, flue ferrules, pipe and tubes.

54. Copper, No. 2—Sheet, sheathing and roofing free from paint and nails.

55. Copper, No. 3—Sheathing and roofing with paint and nails.

56. Copper, No. 4—Battery.

57. Copper, No. 5—Dross and oxide. Report separately.

58. Lead—Sheet, pipe, etc.

59. Lead Battery.

60. Lead—Battery mud or sediment. Specify wet or dry.

61. White metal, No. 1—Including various mixtures of clean bearing or lining metals, such as babbitt, metallic packing, etc.

62. White metal, No. 2—All non-bearing white metals such as lavatory basins, exclusive of aluminum.

63. Zinc, battery or sheet. Specify kind.

64. Bag and burlap—bagging, sacking and waste covering.

65. Barrels—Specify kind and with or without heads.

66. Beltings—No. 1 leather belting 6 in. wide and over. No. 2 leather belting, under 6 in., punchings and and trimmings.

- No. 3 rubber belting, all kinds.
No. 4 composition belting.
67. Canvas—Specify whether new or old.
 68. Carpet—Linoleum, plush and rags. Specify kinds.
 69. Rope—Manila rope free from bow fenders.
 70. Rope, tarred and marlin—Manila bow fenders, tarred rope and marlin. Specify kind.
 71. Rubber, No. 1—Air brake and signal hose, free from wire and fittings; rubber boots and shoes without leather soles, rubber aprons.
 72. Rubber, No. 2—All other hose, such as steam, water, tank, pneumatic, tool and washout hose, free from wire and fittings.
 73. Rubber, No. 3—Rubber-lined fire hose.
 74. Rubber, No. 4—All wire-wound and wire-inserted hose, including oil and paint hose.
 75. Rubber, No. 5—Rubber, packing, gaskets, diaphragms, matting, step treads, etc.
 76. Rubber, No. 6—Auto tires, solid and pneumatic, including tubes, free from fittings. Specify material.

The classifications as outlined above are for general use. It is not necessary that all items specified in a particular classification be included. If, by separating, a higher price may be obtained, it is recommended that sale be made under the classification consisting of single item. In Class 24, Melting Steel, a higher price may be obtained by selling separately such items as rail ends, couplers, knuckles, coil



Press Used for Straightening Brake Shoe Keys

and leaf springs. While these may be included in Class 24, it is not necessary to combine any item that commands a higher price when sold separately. The committee recommends separate classification and sale where practicable.

Reclamation

After reviewing previous committee reports, certain operations have been found impracticable and the elimination or modification of the following is suggested:

Class 1-A: Item 14—Tables, switch stand—When cracked or broken, repair by welding process. Cost prohibitive.

Class 1-B: Item 4—Joints, continuous—If cracked, repair by welding process. It is not considered good practice to weld cracked continuous joints.

Class 11: Item 3—Bolts, engine—Cut down large sizes to smaller, either in length or diameter. Eliminate the smaller diameter. Not profitable.

Class 12: Item 3—Springs, coil—Change to "Manufacture Nail Pullers, Ripping and Stone Masons' Chisels and similar tools."

Class 18: Item 8—Planks, spring—Splice if practicable. Not good practice from economical standpoint.

Class 20: Item 5—Gears, draft—Recover and return to manufacturers for repairs. Change to "Recover and Repair."

Class 22: Item 5—Heads, air brake piston—Turn down to smaller diameter and build up by oxy-acetylene process. Not profitable.

Class 29: Item 2—Axles, scrap—Turn down larger axles to smaller sizes. Not practicable account varied dimensions of journals.

Class 36: Item 8—Staffs flag—Change to "Manufacture from mill offal."

Class 47: Item 4—Paint, old—Scrapings from barrels and other containers. No reason why the barrels should not be cleaned as emptied, removing the cause.

Division VI should obtain the co-operation of the Mechanical division in reclamation practices. It is, therefore, recommended that a committee of Division VI representing reclamation be appointed to meet with a like committee of Division V and review reclamation problems of interest to each division and the railroads at large. Through this committee, a closer relation on reclamation processes and their uses would be obtained, resulting in a tremendous saving to the railroads.

The committee recommended that a limit of tolerance be established on reclaimed articles used by the mechanical and maintenance of way departments, and that this be brought before these bodies with a view of assisting the purchasing and stores departments in reclamation of materials that will be acceptable when brought to standard requirements.

Reclamation of train control parts should be considered. Draft gears superheater units, coil and leaf springs offer possibilities of large saving through reclamation. These and other similar articles should not be attempted without some study of the process or method involved, also with respect to proper facilities to insure economical production and an article that will render service.

Reclamation of Journal Packing

One of the most important items of material in railroad use is the packing which is applied to oil boxes in use on freight and passenger cars, and tenders of locomotives. A large saving can be made in reclaiming waste in comparison with the cost of new packing, new oil, cooling compound and new journal bearings.

The first point in reclaiming waste is its removal from oil box. The person removing waste should use a suitable packing hook so that the waste is not pulled apart, causing short strands. All waste received from various points should be weighed in barrels or other containers so that the gross, tare and net weight can be obtained.

Of the total amount of waste handled for the month at least 85 per cent of same should be reclaimed. The other 15 per cent comprises short ends of waste, sand and other foreign matter.

A method of reclaiming Journal box packing is described: Waste received for reclaiming is taken out by hand from barrels and placed on a sorting table and left there to dry for 12 hr. It is then shaken by hand. The waste is then removed to waste vats which have a steam pipe radiator to heat the oil in the vat. The vat contains approximately 400 gal. of car oil; the heat of the oil being regulated to meet the condition of the waste. After 20 min. the waste is washed in this warm oil: (1) to wash the waste; (2) to remove any material such as cinders, dirt, etc., which cannot be done on sorting table by hand.

After the waste is thoroughly washed it is put on a draining rack for 16 hr. As this is drying it is going through a heat sweat of 170 deg. F. to evaporate moisture.

A large amount of oil is recovered and reclaimed by having all oil in the vat removed every two weeks. This oil is first put into an oil filter to remove all water and impurities. It is then put into a separator after which it is mixed with waste that has been reclaimed. All oil not found fit for car oil is used in oiling switches, etc.

During 1926 there was reclaimed and shipped to outside points 280,751 lb. of waste at a saving of \$13,657 at the following charges:

Scrap value	\$1,252
Value of new material	521
Labor	1,006
Supervision	397
Shop expense	430
Total cost	3,608
Value new	17,266
Saving	13,657

Committee: G. W. Lieber (chairman), superintendent of reclamation, M-K-T; G. W. Alexander, general storekeeper, C. of J.; E. J. Becker, general inspector of stores and supply train service, S. P.; I. C. Bon, superintendent of reclamation, Wab.; R. D. Crawford, general storekeeper, Gulf Coast lines; T. S. Edgell, storekeeper, M. & O.; J. R. Enscoe, superintendent reclamation plant, N. Y., N. H. & H.; J. S. Genther, general storekeeper, L. & N. E.; R. K. Graham, division storekeeper, A. T. & S. F.; L. V. Guild, purchasing agent, O. S. L.; J. J. Jordan, storekeeper, D. L. & W.; J. P. Kavanagh, general storekeeper, C. & O.; J. C. Kirk, assistant general storekeeper, C. R. I. & P.; C. N. Lammers, supervisor of reclamation, C. & E. I.; J. L. Ortner, super-

visor of scrap and reclamation, Erie; A. L. Prentice, supervisor of scrap and reclamation, N. Y. C.; E. J. Remensnyder, assistant to purchasing agent, Penna.; C. B. Tobey (chairman ex-officio), general storekeeper, L. V.

Discussion

G. W. Lieber (M.-K.-T.), Chairman: We endeavored to compile a scrap classification to conform with the various committees of the National Association of Purchasing Agents and the Scrap Dealers Association and to comply with the request of the Department of Commerce as nearly as possible to the Master Scrap Classification insofar as it affected the railroads. I believe the stores department is handling reclamation on the majority of the railroads. However, we must look to the mechanical, maintenance of way, and other departments to use reclaimed materials. Consequently we must confer with them to learn their requirements. I believe that if a joint committee between Divisions V and VI can be arranged, we will reap results.

At the request of A. W. Munster (B. & M.), Chairman Lieber presented a detailed review, item by item, of the manner and extent to which the proposed A. R. A. scrap classification differs from the existing A. R. A. classification.

W. Gerber (Southern): Do you have any figures that would guide you in classifying bolsters, brake beams and similar materials into one class?

C. N. Lammers (C. & E. I.): We conferred with the Scrap Dealers Association of Chicago, also with the records of the railroads and decided that because the smaller railroads desire to lump this material, it would be advisable to make it one classification. If any railroad cares to sell a single item it may do so.

Mr. Lieber: Heavy turnings and chippings weigh in excess of 75 lb. per cu. ft. Some members of the Association of Purchasing Agents and also of the Scrap Dealers Association believe that 75 lb. per cu. ft. should be embodied to prevent the addition of light turnings and chippings. Heavy turnings from rails or tires, or chippings will weigh in excess of 75 lb. per cu. ft. The 10-lb. requirement was in the specification of the National Association of Purchasing Agents originally and also in the master scrap classification. It was eliminated originally as a railroad classification because tie plates and other small articles which could be and should be included in the No. 1 heavy melting weigh less than 10 lb.

Mr. Munster: How definite is this schedule? I would regret having the A. R. A. classification abolished and adopt this, and then in six months perhaps have to change to another classification.

C. B. Tobey (L. V.): About four years ago the National Association of Purchasing Agents brought out a classification of iron and steel scrap with the idea that scrap produced in accordance with it would be immediately available for use in the different mills. It was promulgated through the Bureau of Standards and has been commonly called the Master Scrap Classification. There has been pressure brought upon all of the producers and users and dealers in scrap throughout the country to adopt that specification. It is primarily a consumer's classification, while we are interested in the producer's end only. What we have presented is a combination which we think will fit your needs, and as far as I can see it should be permanent.

F. D. Reed (C., R. I. & P.): Did the consumer insist on the 75-lb. per cu. ft.? Is there an opportunity for a scrap dealer to reject a carload on this basis provided

he finds anywhere in the car a cubic foot of scrap that will not weigh 75 lb.?

Mr. Tobey: Heavy turnings No. 1 from axles and tires will weigh well in excess of 75 lbs. per cu. ft.

Mr. Reed: *I move it be eliminated if there is no objection on the part of the committee.*

Mr. Lieber: You can get a better price for the turnings at 75 lb. per cu. ft.

A. L. Prentice (N. Y. C.): The 75 lb. turnings are just as necessary as 18 in. by 6 ft. of the heavy melting steel. These turnings are used for open hearth.

Chairman Curtis: The motion before the house is that we eliminate the 75 lb. classification.

[The question, put to a vote and lost.]

Mr. Kirk: I made inquiries of some foundries that use bolsters and side frames and found that they pay a little higher price. We have been selling our bolsters separately for a number of years. They lay bolsters on top of the charging box.

Mr. Lieber: Flues should never be sold until they have been rattled to determine whether they are scrap. There are many uses for a flue and a much better price



Operating a Tractor

can be obtained by selling them under a separate classification.

[A motion to accept the scrap classification carried.]

Chairman Curtis: The reclamation is next and a motion is in order to accept the committees report on reclamation.

Mr. Nelson: The committee eliminated certain items from our previous list. They have under 22. "Heads, air brake piston—turn down to smaller diameter and build up by oxyacetylene process. Not profitable." The original list showed air pump piston heads and I believe it is a standard and profitable practice on many railroads.

Under group 29, Scrap Axles—"Turn down larger axles to smaller sizes. No practicable account varied dimensions of journals." That is being done and my understanding is many roads consider it a profitable practice.

Under class 11 you have engine bolts—"Cut down large sizes to smaller, either in length or diameter. Eliminate the smaller diameter. Not profitable. That is followed universally and certainly it is profitable.

Mr. Lieber: With reference to item 22: No member of the committee could find it profitable to cut down

a large size bolt to a smaller size. There was considerable discussion on that but the report specifically states "heads air brake piston."

On item 29, if any railroad is turning down axles to a smaller dimension the committee would like to hear from it because it was unable to find anyone who did it.

J. L. Irish (O. W. R. & N.): We batter up the end so as to give a full collar, giving us a saving of about \$10 an axle.

Mr. Lieber: This specification does not cover an upset axle.

[A motion to accept the report on reclamation was carried.]

Report on Standardization and Simplification



W. L. Hunker
Chairman

The railroads were requested to furnish a list of the sizes used and their average monthly consumption in the following commodities:

Switch Ties
Lag Screws
Studs
Staybolts
Taper Bolts
Flues—Boiler
Flues—Superheater
Flues—Arch
Sheet Copper
Copper Ferrules
Mechanical Steel Tubing

Switch Ties

The information received indicates adherence to a 7-in. by 9-in. tie, to a great extent. Of the 30 roads reporting, 3 use ties in 3-in. breaks, 23 in 6-in. breaks, and 4 in 1-in. breaks.

Excluding roads using special sizes for headblocks, five roads use two or more dimensions in widths or thicknesses. It is the recommendation of the committee that the few roads purchasing ties in 3-in. breaks, discontinue the practice. A 50 per cent reduction in the number of sizes carried can be effected by changing the standard to 6-in. breaks.

Lag Screws

The table below shows the standard diameters and lengths agreed upon:

Dia., inches	Length, inches									
	1½	2	2½	3	3½	4	4½	5	6	
¾	X	X	X	X	X	X	X	X	X	X
½	X	X	X	X	X	X	X	X	X	X
¼			X	X	X	X	X	X	X	X
3/16				X	X	X	X	X	X	X

The number of sizes reported was 91. The number retained was 29 or 32 per cent. The 68 per cent eliminated, represents 18 per cent of the consumption.

Studs—Standard U. S. S. Thread

The information furnished shows a lack of uniformity as to stocks carried by the different railroads—some reporting that studs are not carried in stock while other roads carry a large number of sizes, lengths and kinds, for many of which there is little demand.

Four of the 21 railroads reporting carrying studs are ordering in ½-in. variations, but show small consumption of the ¼-in. and ¾-in. variations. The sizes recommended are as follows:

Dia., inches	Length, inches									
	1½	2	2½	3	3½	4	4½	5	5½	6
¾	X	X	X	X	X	X	X	X	X	X
½	X	X	X	X	X	X	X	X	X	X
¼		X	X	X	X	X	X	X	X	X
3/16			X	X	X	X	X	X	X	X
1/8				X	X	X	X	X	X	X

The number of sizes reported was 209—the number retained 63, or 30 per cent. The 70 per cent eliminated represents but 26 per cent of the consumption.

Staybolts

The information furnished indicates much difference between roads, in the lengths carried. After analyzing the reports, the committee recommends that drilled or hollow staybolts be carried as shown in the table:

Dia., inches	Length, inches							
	6	7	8	9	10	11	12	
1½	X	X	X	X	X	X	X	X
1	X	X	X	X	X	X	X	X
¾	X	X	X	X	X	X	X	X
½	X	X	X	X	X	X	X	X
3/8	X	X	X	X	X	X	X	X

Of the 190 sizes reported, the table recommends 34, or 18 per cent as standard. The 156 sizes discontinued represent but 23 per cent of the consumption.

On flexible staybolts, the information furnished did not contain sufficient data to allow analyzing. The committee recommends that they be stocked in 1-in. breaks, which is the present practice of many of the roads.

On radial staybolts, it is recommended that they be carried with upset ends, sufficiently long to allow stocking in 2-in. breaks.

Taper Bolts

One railroad reports carrying in stock approximately 800 different sizes of finished taper bolts, for locomotives. Other railroads report carrying the rough hexagon head bolts in stock, and shops turning to required size and taper as need. The committee recommends that no attempt be made to stock these, especially since most modern shops are equipped with portable machinery for turning the bolts at the locomotive.

Flues—Boiler

Practically all roads are using .120 or 11 gage boiler flues. A check of the information shows that some roads have reduced the number of lengths of each diameter to a greater extent than others. It is recommended to discontinue the lengths with small consumption. There will not be any appreciable waste, as ends cut off can be used for safe ending.

Some roads still furnish 1½-in. and 1¾-in. flues, presumably for wrecker and pumping station equipment. It is recommended that these flues be changed to 2-in., as second-hand 2-in. flues can ordinarily be obtained.

Flues—Arch

The majority of the railroads order these as .180 or No. 7. Some roads have reduced the number of lengths considerably. While ends cut off are wasted, it is recommended that each road discontinue such sizes as show a low consumption.

One road has reported that since this item was called to its attention, through this committee, that it has been able to consolidate seven lengths into three, without increasing to any extent the waste from cutting back for certain classes of locomotives.

Flues—Superheater

The majority of the railroads have already adopted .148 gage, No. 9 superheater flues. Some roads have reduced the number of lengths to a great extent. Many railroads have both 5¼-in. and 5½-in. flues, of the same, or nearly the same length. One railroad with such conditions recently found it feasible to replace the 5¼-in. flues with 5½-in. as the locomotives required new flues, thereby relieving the stores department from carrying an additional size.

Sheet Copper

The information shows a wide variation in the manner of ordering and in the sizes. The committee feels that all interests would be served by ordering all copper 30-in. wide in 60-in. and 96-in. lengths, and in gages from .009 (No. 32) to .165 (No. 8), using the decimal equivalents to the Stubbs gage. No attempt has been made by the committee to standardize between cold rolled and soft copper, as its use governs the kind required.

Copper Ferrules

The reports received show 232 different sizes, widths, gages, etc. The committee recommends standardizing on the following:

Outside diameter, in.	Width, in.	Gage
1½	¾ and ¾	.065 and .072
1¼	¾ and ¾	.065 and .072
1	¾ and ¾	.065 and .072
¾	¾ and ¾	.065 and .072
½	¾ and ¾	.065 and .072
3/8	¾ and ¾	.065 and .072

Outside diameter, in.	Width, in.	Gage
2 3/4	3/4 and 3/4	.065 and .072
2 7/8	3/4 and 3/4	.065 and .072
2 1/2	3/4 and 3/4	.083 and .095
3	3/4 and 3/4	.083 and .095
3 1/2	3/4 and 3/4	.083 and .095
3 3/4	3/4 and 3/4	.083 and .095
4	3/4 and 3/4	.083 and .095
4 1/4	3/4 and 3/4	.083 and .095
4 1/2	3/4 and 3/4	.083 and .095
5	3/4 and 3/4	.083 and .095
5 1/2	3/4 and 3/4	.083 and .095

This list effects a reduction of 168 items or 72 per cent. There is a great variation in the way ferrules are ordered by the different railroads. Many of the reports show gages for which there is nothing comparable in the standard gage used by the copper rolling mills, indicating either the necessity for special rolling or substituting the nearest standard sizes rolled.

Mechanical Steel Tubing

The information covered such a wide range that it was impossible to draw any conclusions as to recommendations of standards. One road with approximately 1,700 locomotives, reports only nine sizes of tubing carried; another road of equal size reports 15; while another in approximately the same position, carries 74, and another 94.

Claw Bars

One of the track tool manufacturers recently stated that it maintained dies for 57 kinds of claw bars, to serve customers. The Roadmasters' Association has adopted a claw bar, which is recommended as standard. A representative of one manufacturer stated that if railroads all ordered the same bar, it could fill orders more promptly, and would be able to reduce costs by running larger quantities.

Copper Tubing

A total of 29 railroads reported carrying 204 kinds of tubing in 34 dia., ranging from 1/4 in. to 3 1/2 in. One diameter, 3/4 in. was ordered in 16 thicknesses, ranging from .0625 to .1875. The committee recommends the following standards.

Diameter, in.	Gage	Diameter, in.	Gage
1/4 .....	.065	1 .....	.120
3/8 .....	.095	1 1/4 .....	.120
1/2 .....	.065	1 1/2 .....	.120
5/8 .....	.065	1 3/4 .....	.120
3/4 .....	.083	2 .....	.120
7/8 .....	.083	2 1/4 .....	.120
1 .....	.095	2 1/2 .....	.120
1 1/4 .....	.120	2 3/4 .....	.134
1 1/2 .....	.120		

This reduces the number of diameters from 34 to 17, or 50 per cent, and the other dimensions from 204 to 17, or 91 1/2 per cent. The consumption of the 187 items eliminated is 40 per cent of the total.

Savings Effected by

Standardization and Simplification

Many of the railroads do not have available any figures as to their savings, but it is the opinion of the committee that it will be 10 per cent of the annual amount of the purchases of the items considered. One railroad reports that between 1922 and 1925, it reduced the number of items of steel and iron bars, plates, shapes and sheets by 59 per cent. During that time the purchases increased 25.5 per cent in money value. During the same period, the average purchases per item, in that class of material, increased 205 per cent, in money value. It is impossible to state whether or not this effected the price per lb., but it materially reduced the cost attendant upon ordering and accounting for the material, as well as the storehouse space required.

A Systematic Study

One railroad, by making a systematic study of some items, has been able to eliminate—

- 24 sizes of copper tubing.
- 18 sizes of brass tubing.
- 93 sizes of cold rolled steel tubing.
- 1,289 fabricated steel car parts.

The stock investment saving on the steel car parts alone

on this road is approximately \$43,000, based on normal quantities previously carried, compared with what is now carried.

There is a field for study in parts for mechanical and other appliances. Often standard commercial items can be utilized in preference to purchasing. This is especially true of such items as cap and set screws, small bolts, etc. It has also been found, in some cases, that the same article is identical on two widely separated appliances, and the price from one manufacturer is higher than from the other.

Obsolete Materials

Many railroads are confronted with an accumulation of obsolete material, which should have been charged out as it became obsolete. It was not so charged because, at the time, the using department did not find it convenient to finance the depreciation on account of not having a sufficient allotment to take care of it in current expenses.

A monthly allowance is recommended whereby the general storekeeper will be provided with money for charging off the difference between the book value and the scrap value of obsolete material scrapped.

A Monthly Allowance

Where railroads have a large accumulation of obsolete material, it may seem impracticable to provide a monthly allowance for current charging off of depreciation. It should be understood, however, that the recommendations of this committee, are based on the principle that these accumulations will eventually be liquidated and that the obsolescence of material will then be a current problem. This will be more or less uniform from month to month, in the same manner as operating expenses. Even then, there may be occasions when unusual amounts of depreciation will have to be charged off at one time, as in retiring locomotives, cars or other equipment. Such charges should be covered by an extraordinary appropriation, in the same manner as unusual programs of repairs, and should not be deducted from monthly allowances.

If a monthly allowance plan of financing the depreciation of obsolete material from its book value to scrap value is adopted, it will be necessary to have some means by which information may be developed as to whether a surplus or inactive item of material is really obsolete. This form will also furnish a record of the amount of material scrapped, against which monthly allowance charges may be checked, as well as to form a basis on which the allowance for future months can be estimated.

The Committee

Committee: W. L. Hunker (chairman), district storekeeper, C. R. I. & P.; D. W. Corcoran, general storekeeper, C. & N. W.; A. G. Follette, assistant chief material supervisor, Penna.; A. M. Gage, assistant general storekeeper, M. C.; L. V. Hyatt, supervisor of standardization, M. P.; G. W. Leigh, assistant purchasing agent and general storekeeper, M. St. P. & S. S. M.; J. E. Mahaney, superintendent of stores, C. & O.; E. S. Marsh, general storekeeper, W. & L. E.; H. W. Concannon, district storekeeper, S. P.; E. W. Peterson, general storekeeper, Bangor & Ar.; E. H. Price, general storekeeper, N. Y., N. H. & H.; J. W. Wade, general storekeeper, N. & W.; F. C. Warren, general storekeeper, St. L.-S. W.; H. C. Stevens (chairman ex-officio), general storekeeper, Wab.

Discussion

W. L. Hunker (C. R. I. & P.), chairman of the committee, introduced the report by giving an outline of the work of the Division of Simplified Practices of the Department of Commerce and the relation of this to the work of his committee. He also cited the many items of material used by the railways which offer a fertile field for a reduction of sizes, styles, shapes, etc., in the interest of simplification and reduction of stocks. He recommended that the report be printed in pamphlet form for convenient distribution as a means of calling wide attention to the opportunities for economy to be gained through a campaign of simplification and standardization.

[The report was accepted without further discussion.]

Price Index of Commodities Facilitates Comparisons

By James Deery

Assistant to Purchasing Agent, Pennsylvania



James Deery

Indexes of commodity prices are now generally based on the prices prevailing previous to 1916. The Department of Labor, however, uses 1913 prices as its basis in arriving at an index of prices on 404 representative items.

There are two methods—the weighted and arithmetical—of making price indexes. A weighted price index is built on the relative value of each item to the total value of all

items considered. An arithmetical price index is arrived at by adding the various index numbers and dividing the total by the number of items.

It is difficult to reconcile the price indexes published by economists, banks, and statisticians, with the prices paid for material used by the railways. For the purpose of comparison, however, the purchases of a railway of approximately 4,000 miles of track were reviewed for the years 1912 to 1915, inclusive, and 44 items were selected. Excluding coal and equipment, these 44 items represented: 61 per cent of the value of the total purchases in 1912; 53 per cent in 1913; 68 per cent in 1914, and 62 per cent in 1915, with an average of 61 per cent for period 1912-1915, inclusive.

The number of units of each of the 44 items were calculated, and the average price per unit for each of the four years mentioned, was tabulated. After reviewing the items tabulated, it was decided, since the Department of Labor uses 1913 as its basis, to have that year represent the weighted index in making the following comparison:

	1912	1913	1914	1915	1926 Dec.	1927 Jan.	Feb.	Mar.	Apr.
Weighted price index on the 44 items.....	97.1	100.	96.7	97.8	153.9	156.9	157.0	156.8	156.6
Arithmetic index on the 44 items.....	98.7	100.	92.5	96.2	154.3	155.0	155.4	154.4	153.6
Bureau of Labor index 404 items.....	99.1	100.	98.1	100.8	147.2	146.9	146.4	145.3	144.2

The reaction to a review of the details used in preparing the above comparison, suggests the following comments:

(a) The most accurate is the weighted price method for while it entails more clerical effort than is required to prepare the arithmetical price index, and while the latter is in some cases only a point or two higher or lower, it is highly important that the index be as accurate as it is possible to make it, especially since only a point in the index means on the present trends a difference to Class I railways, of \$8,000,000 annually.

(b) While the 44 items are still important factors of the total purchases, they are relatively lower than they were in 1913, due to changed conditions increasing the purchases of items not included in the 44 mentioned. However, a carefully selected list of 80 items should make an index that would reflect general price trends for railway commodities.

(c) A weighted price index representing the prices actually paid during a month could become an important factor in measuring the efficiency of an office. A purchasing office might have an ideal record; it had delivered the material required in every case, during the month, on the day it was needed or according to its schedule, but if the price index of the prices actually paid is higher than the price index of prices quoted for the same materials, then the purchasing office stands indicted for failing to perform efficiently until it shows the higher prices were necessary through no fault of the purchasing office.

(d) A price index of railway commodities makes it possible to visualize comparisons readily, and a change in trend in any item becomes more conspicuous than if it is reviewed in a statement showing actual prices with such abstract symbols as feet, pounds, etc.

This paper has been prepared with the thought of suggesting that a committee be appointed to study the best method of preparing a list of commodities, and defining a uniform system of building up an index.

Report of Committee on Fire Prevention



W. H. Morris
Chairman

Careful and cleanly maintenance of storehouses and proper methods in the storing and handling of materials will be the best safeguards against fire.

A competent storehouse employee should be appointed to inspect storehouses daily, prior to closing time, to see that the premises are kept clean and free from anything which might cause fire. Regular inspection promotes good house-keeping.

Metal containers with a suitable lid should be used to store all packing materials, rubbish and sweepings. The containers should be emptied and contents disposed

of prior to closing time.

Storage and Care of Material

Material should be stored in bins or racks of the open or daylight type or on island platforms. It should not be located where it will interfere with the proper use of fire apparatus.

Acetylene and hydrogen are inflammable gases, the con-

tainers or cylinders for which are susceptible to mechanical injury and possible explosion. Cylinders should be stored in well ventilated buildings or sheds remote from other buildings or inflammable material. When acetylene and other gases are stored in the same compartment, an open space of at least 10 ft. should separate the acetylene and other gases. Where individual buildings are available it is advisable to store separately. Signs should be placed on storage buildings, reading: Danger—Keep Lights and Fires Away. Open flame lights or fires or smoking should never be allowed in storage buildings.

Calcium carbide should not be kept in storehouses with other material. A separate corrugated iron or similar fire-proof structure with good ventilation should be provided. Damaged and emptied containers of calcium carbide should be removed promptly. Tight metal containers only should be used.

Charcoal should be stored in a weather-proofed, well ventilated building, vault or bin which should not be used for the storage of other material. Where a small quantity is stored in a building with other material, it should be separated in a metal bin or vault. At least every three months all charcoal should be removed and bins cleared.

Inflammable Liquid.—Alcohol, amyl acetate, gasoline, naphtha, turpentine, etc.; main supply should be kept in an underground tank installed in accordance with Underwriter's

requirements. Where supply of one barrel or less is carried it should be obtained in a metal drum and kept in a detached corrugated iron or non-combustible building at least 50 ft. from all property, building to be kept locked. Signs reading: Danger—Keep Lights and Fires Away, should be conspicuously posted.

Fusees, torpedoes and matches should be stored in separate, dry fire-proof vaults, when kept in large quantities, and small quantities for local delivery to be kept in metal containers, with sliding lid and lined with $\frac{3}{4}$ in. sheet asbestos.

Journal box packing and oily waste should be kept in metal containers with self-closing lid. This does not apply to large vats used in manufacturing of packing.

Lumber and crossies should not be piled within 100 ft. of buildings. Surrounding storage ground should be kept free of grass, leaves, etc., and adequate space maintained between piles to reduce the likelihood of a fire communicating from one pile to another.

Oils should not be carried in storehouses with other materials, but should be kept in separate buildings of fire-proof construction, properly protected with approved fire apparatus.

Oxygen is a non-inflammable gas, the cylinders are subject to mechanical injury, and possible explosion. Extreme care should be exercised to prevent injury to tanks. Cylinders must be stored in well ventilated buildings or sheds. When oxygen and inflammable gases are stored in the same compartment, an open space of at least 10 ft. should separate the oxygen and inflammable gases. Oil or grease of any kind should never be used in or around oxygen regulators, gages or other fittings. Where separate buildings are available it is advisable to keep separately.

Paints and varnishes in metal containers and in small quantities can be stored in storehouses, but the main stock should be kept in a separate building of fireproof construction, properly protected with approved fire apparatus.

Waste, broken lots, should be kept in a metal or metal lined bin provided with self-closing cover.

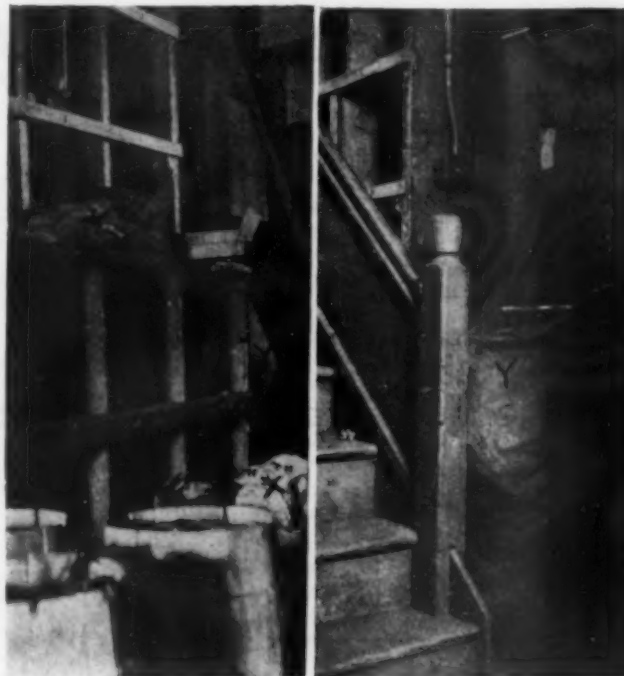
Transportation: All supply cars containing explosives or inflammable material should be properly placarded in accordance with I. C. C. regulations.

Buildings

Storehouses and equipment should be of fireproof construction and where it is necessary to have other depart-

ment and should be located at least 50 ft. from other buildings. Fire protection as approved by the National Fire Underwriters should be installed in these buildings.

Electric lamps in storehouse buildings should be well supported and equipped with substantial wire guards where



Fire Hazards in Storehouses

subject to mechanical injury or likely to be placed in contact with combustible material. For portable electric lamps reinforced wiring or cable should be used and lamps protected by wire guards. Electric lamps in rooms where inflammable

RAILROAD FIRES

Year	No Fires	Value
1923	8395	\$ 9,001,122.66
1924	8609	10,049,936.45
1925	7866	7,397,433.98
Total	24870	\$ 26,448,493.09

1923	112	Storehouse Buildings and Contents	\$ 867,247.66
1924	80	" " " "	187,001.96
1925	71	" " " "	327,860.31
Total	263		\$ 1,382,109.93

SOME CAUSES OF FIRES

	1923		1924		1925	
	No. Fires	Loss	No. Fires	Loss	No. Fires	Loss
Careless burning of rubbish and material	149	\$ 75,235.57	209	\$ 85,598.01	259	\$ 132,408.93
Explosives	19	55,637.95	34	65,034.92	3	123.37
Electric Wiring	153	603,829.27	197	411,618.07	189	322,302.90
Fuel Oil Systems	30	51,185.31	30	107,861.32	18	28,208.28
Fuses	15	14,024.65	19	2,541.46	11	6,871.98
Gasoline Oils, etc.	80	36,201.08	54	82,111.58	53	46,175.44
Heating Appliances and Flues	998	528,716.45	1115	811,576.83	881	441,313.45
Lighting Appliances	134	58,745.31	130	52,756.70	132	53,306.80
Matches	73	23,916.97	66	45,618.87	76	29,423.62
Smoking	472	1,533,065.54	411	722,613.35	465	605,782.19
Spontaneous Combustion	254	155,367.52	271	340,276.20	237	327,105.21
Waste and Wooden Lockers	34	52,278.30	14	5,592.50	7	1,095.47

Exhibit A—Statistics of Fire Losses in Storehouses

ments in the same building, fire wall and doors properly constructed should separate the storehouse from such other departments. Proper fire protection should be provided by the use of sprinkler systems, hose reels, connected to outlets on a fire line, and fire extinguishers as approved by the National Board of Underwriters.

Buildings for the storage of oil, paints and other inflammable or explosive materials should be of fireproof construc-

tions and should be provided with vapor proof globes and keyless sockets.

The practice of using abandoned light constructed frame buildings, wooden box car bodies, etc., which are obviously to be classified as fire hazards, to store material should be discouraged.

In addition to the proper storing and handling of material and the extreme caution necessary for the prevention of

fires, it is of the utmost importance that proper facilities be provided for protection.

Fire alarm stations should be conveniently located, the number to be governed by the size of the storehouse. Where practicable a separate fire alarm system should be provided.

Fire brigade organization.—The stores department employees at each store should be organized into fire brigades for service in case of fire in the stores.

The fire extinguishers, hose reels, sprinkler system valves, etc., should all be numbered and the handling or operation assigned to one or more such storehouse employees.

The organization should be under the direction of the local fire marshal, chief of brigade or captain.

The storekeeper or assistant should take an active part and be responsible for the stores department brigade.

Fire drills.—It is advisable to hold frequent practice drills, not less than semi-monthly, at which time proper inspection of equipment should be made. A record of such drills, with details of time called and time to respond, etc., should be kept on file, together with condition of equipment. The drills will enable the men to become familiar with handling of equipment.

Where an actual fire has occurred, and cause determined, the information should be posted, in order that proper precaution is taken thereafter.

Fire apparatus.—The use of fire apparatus for other than fire purposes should be prohibited. Signs, bulletin notices and red incandescent electric lamps should be used to designate the location and operation of fire apparatus. Fire equipment, after use, should be immediately returned to its proper place thoroughly examined, cleaned, and repaired if necessary.

Watchmen system.—Storehouses where conditions justify, should be patrolled at least hourly, by watchmen, at nights and on Sundays, and holidays, such service commencing immediately after closing hours and continuing until same is opened for business.

Watchmen's stations should be so placed that it will be necessary for the watchman to see all parts of the building, etc., when making rounds, and all points should be made accessible to him.

Lumber and material yards.—A separate water pipe line system for fire protection should be installed with sufficient fire hydrants, conveniently located. Hose should be located at each hydrant and kept in a small house on a reel. Where the above system cannot be installed, the yard should be equipped with water barrels and metal fire pails, distributed properly throughout the area. The barrels and pails should be labeled in ample-sized letters—For Fire Only. The barrels should be kept completely filled at all times with water, treated to prevent freezing. Salt or calcium chloride is generally used to prevent freezing. Roadways should be posted with fire signs and kept unobstructed.

Records.—Stock books, unpaid invoices, open receiving

tallies and important papers, etc., should be kept in metal containers of a size easily handled and stores department employees assigned and made responsible to see that these records are removed to a safe location when an alarm is sounded.

Attention is called to Exhibit A, giving the loss due to railroad fires, also storehouse buildings and contents, together with some of the causes. The report covers the last three years available at this time.

Committee: W. H. Morris (chairman), assistant general storekeeper, Reading; L. J. Ahlering, general storekeeper, C. & E. I.; C. A. Marshall, stores inspector, Wab.; I. G. Morrison, storekeeper, C. B. & Q.; W. F. Rodman, traveling storekeeper, C. & N. W.; W. J. Smith, tie and timber agent, M-K-T; C. E. Smith, general material supervisor, Penna.; W. W. Williams, supervisor of line stocks, N. Y. C.; L. Lavoie (chairman ex-officio), general purchasing agent, C. N.

Discussion

Chairman W. H. Morris (Reading) presented the report. A long discussion ensued concerning fireproof construction of storehouses and the use of steel versus wood for material racks and bins. One member cited a case where lightning struck a storehouse equipped with steel shelving damaging the building to the extent of \$2,100, while only \$51 damage was done to the stock and this was water damage. The steel racks prevented a serious fire. The discussion of this feature of the report was closed by U. K. Hall (U. P.) who said that the type of building and the rack construction is a matter to be decided between the engineering department and the management but that the important thing for the stores department to do is to exercise every possible precaution against fire consistent with the equipment supplied to it.

In response to a question from H. Weindel (U. P.), Chairman Morris said the requirements for piling containers filled with acetylene and other gases were taken from the rules of the National Fire Prevention Association and of the American Railway Association.

L. T. Hoffman (U. P.): I am particularly interested in what the committee says about inspection and good housekeeping. Thorough inspection and thorough training in fire prevention are particularly necessary in store-keeping. As a rule employees are willing to carry out instructions if they are properly trained and know what to do.

[A motion to accept the report carried.]

Report on Stationery and Printing



W. W. Griswold
Chairman

The buyer of railroad printing should interest himself in the application of the form so that its construction will fit the users' actual requirements. The width of columns, style of printing, quality of paper, etc., should be carefully analyzed so that when the form is ready to purchase the size will be as small as consistent, and cut from standard papers without waste.

Purchases should be arranged for on a competitive basis and quantities to be ordered should be regulated by the consumption. In view of the fact that printed forms on railroads change little, the li-

ability of loss is small when, in order to secure the lowest possible price, the purchase units is increased to a six months' or even a year's supply. Deferred deliveries can be arranged for and the invoices handled for payment as deliveries are made.

Additional savings running from 10 per cent to 40 per cent are possible by purchasing from printers who specialize in grouping forms. It is not necessary for the buyer to group his own forms, as the printer takes care of this. The recommended quantities for combination printing are

from 5,000 to 50,000. A large variety of papers are available, so that the majority of forms, as used on a railroad, can be secured from these combination printers.

There should be a forms committee on every railroad, composed of executives representing the several departments, such as accounting, purchasing, transportation, etc. The chairman should be an officer on the executive staff with full power to act on forms coming up for adoption, revision or cancellation. The details can be performed by the representative of the department interested, and then considered by the committee as a whole when necessary.

Distribution and Control

The problem of efficient distribution starts with the proper preparation of requisitions by the individual officers. Requisitions should be submitted for actual requirements only, for a 90 day period, the only exceptions being the larger offices which require a more substantial quantity and have only limited storage space.

One of the most important methods of securing results is through the aid of stock control, both on the line and at the stationery store. Some railroads have successfully used a book record in the stationer's office for making a comparative check of requisitions submitted.—It is recommended that such a book be used, for the reason that this comparative check prevents over-ordering, with its resultant increased investment due to over-stocking of supplies in excess of requirements at local points.

Some of the member lines are using the so-called Local Stock Book, which is furnished to individual offices for keeping records in detail.

Another important factor is conservation. All railroads should interest themselves in this detail. There are plenty of ways and means of getting results, but some of the more popular methods are through the medium of personal circulars to department heads with recommendations for economical handling of supplies to avoid waste, or inspection of offices by traveling auditors and storekeepers and other traveling representatives, as well as through local office supervision. The employee must be instructed in the proper use and care of the supplies furnished in order to secure maximum results. Suitable storage cabinets should be provided for stationery supplies.

Centralized Mailing

The establishment of bureaus for a service that will save effort is recommended. It has been demonstrated on a number of railroads that bureaus for mailing, mimeographing, typing, computing, etc., have proven economical. Centralized bureaus for distribution of stationery for office buildings in some of the larger railroad centers not close to the stationery store have also proven economical, as reported on two lines.

The committee recommended a number of pertinent items in ordering, storing, and the use of stationery and printing:

Blank paper: No printed letterheads, memorandum blanks or telegraph blanks should be used in communication between the several departments of a railroad.

Envelopes: Kraft paper for all envelopes is recommended. Manila paper deteriorates. A 16-lb. kraft envelope is better and stronger than a 20-lb. manila, and the price per thousand is lower.

Rubber bands: No more than five sizes.

Pins: Pins should be confined to size No. 4 in steel. They should be ordered in papers, and if it is necessary to order in bulk, boxes should not be larger than one-quarter pound.

Pencils: Mechanical pencils should be considered where this item can be purchased at a price that will eventually effect a saving as compared with the use of the present wooden pencil, and where the distribution can be properly controlled.

Pencil sharpeners: Should not be furnished, as they increase the consumption of pencils.

Pens: No more than five sizes or kinds.

Powdered ink: Experiments of 10 years demonstrate that powdered ink from reputable concerns is satisfactory and it effects a large saving in the purchasing as well as distribution, being put up in packages instead of bottles.

Powdered mucilage: Powdered mucilage is being used successfully on a number of the larger railroads and is recommended for general use. The saving in purchase cost is from 50 per cent to 60 per cent and the powdered form is more desirable from the point of distribution than the liquid product.

Ribbons, typewriter: A moderate-priced 12 yd. ribbon is recommended. A number of reliable manufacturers offer low prices on account of quantity production. It is unnecessary to pay \$3 or more per dozen for ribbons. Ribbons will last twice as long if stenographers will change spools so that both edges can be used.

Carbon paper: Carbon paper should be distributed in envelopes of 25 sheets.

It is unnecessary to pay \$5, \$6 and \$7 per thousand for typewriter carbon for general use, as there are a number of responsible manufacturers who are furnishing qualities today that are satisfactory at a considerably lower price. The buyer and distributor should interest themselves in the use of carbon paper to see that the right sheet is furnished to meet individual requirements.

Repeat envelopes: The use of repeat envelopes is well worth while. A number of railroads report substantial savings by so handling; one member line reports an annual saving of over \$5,000 by the use of the various "repeat" forms.

Tariffs: The committee recommended in 1926 a standard specification for the printing of tariffs. It again calls attention to this item. This specification will aid the buyer in the purchase of tariffs and also aid in the checking of invoices.

It is also recommended that the planograph system of printing tariffs be considered wherever possible.

Committee: W. W. Griswold (chairman) stationer, C. R. I. & P.; H. C. Boldebuck, stationery, C. B. & Q.; W. A. Clem, assistant purchasing agent, Reading; James Deery, assistant to purchasing agent, Penna.; Daniel Delaney, stationery storekeeper, C. & A.; J. E. Hobson, stationer, Southern; C. L. Nash, general storekeeper, Fruit Growers Express; V. R. Plank, stationery storekeeper, S. P.; A. B. Rutherford, stationer, U. P.; G. W. Schroeder, stationery storekeeper, I. C.; C. E. Walsh (chairman ex-officio), purchasing agent, Penna.

Discussion

C. C. Anderson (N. P.): We use No. 2 16-lb. manila paper for envelopes which is cheaper than No. 1 Kraft. Manila paper will not deteriorate fast enough to cause damage in a year's supply.

[Several other members expressed a preference for Kraft paper, in some cases using lighter stock.]

[The committee recommended that pencil sharpeners be not used because of waste, but C. D. Baldwin (B. A. R.) said that too much time was lost sharpening pencils with knives and moved that the recommendation be eliminated. Motion carried. A motion to accept the report carried.]

General Committee

The appointments to the general committee are as follows: D. C. Curtis (C. M. & St. P.); J. E. Mahaney (C. & O.); G. E. Scott (M.-K.-T.); H. E. Stevens (Wabash); A. L. Sorensen (Erie); C. B. Tobey (L. V.); M. E. Towner (Western Md.)

The total registration which numbered 505 exceeded that of any previous meeting of Division VI.



New D. & R. G. W. Shops, Grand Junction, Colo.

New Books

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian,
Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Annual Report of the Inland Waterways Corporation, Calendar Year 1926, to the Secretary of War. Issued by Major-General T. Q. Ashburn, chairman and executive, and discussing the lines along which traffic on the Mississippi and Warrior River, rail and river rates, facilities, and possibilities. 33 p. Pub. by U. S. Govt. Print. Off., Washington, D. C. 10 cents.

Factors in Industrial and Commercial Efficiency, by Committee on Industry and Trade, Gt. Britain. Part I of the committee's survey of industries, of which the section "Railway Transport as a Factor in Cost," pages 493-520, and Chapter II on the recruiting and training of personnel with its discussion of apprenticeship, and technical and commercial education, will be of particular interest. 544 p. Pub. by H. M. Stationery Office, London, Eng. 5s.

Facts and Figures of the Automobile Industry 1927, by National Automobile Chamber of Commerce. 8th edition, including besides the regular statistics and information on amounts of traffic furnished railroads by automotive industries, railroads using motor services, etc., the Interstate Commerce Commission findings on uses of motor transportation. 96 p. Pub. by National Automobile Chamber of Commerce, New York City. Apply.

The Place of the Railroads in the Life of the American People. 10 prize-winning essays in a contest conducted among college and university students by the Illinois Central. 23 p. Pub. by Illinois Central System. Apply.

Some Economic Phases of Transportation, by Bureau of Railway Economics. A report to the American Railway Association on outstanding features of transportation in 1926. Miscellaneous series Bulletin no. 43. 27 p. Pub. by Bureau of Railway Economics, Washington, D. C. Apply.

Periodical Articles

Le Block-System Automatique aux Etats-Unis. Summary of first part of report on block-signaling in this country made by engineers of the Paris-Lyons-Mediterranean Railway after personal investigations. *Revue Générale des Chemins de Fer*, May, 1927, p. 436-458.

Material Handling Between Stump and Board, by Landon G. Bell. Complete and interesting presentation of logging, and marketing of lumber, including discussion of special problems of construction, equipment and operation of logging railroads. Illustrated. *Mechanical Engineering*, Mid-May, 1927, p. 503-509.

Metal Ties From Scrap Rails. Economy in a new direction, being developed on the Delaware & Hudson. *Literary Digest*, May 21, 1927, p. 24.

The Need for Commercialism in the Railways of Today, by Ashton Davies. The author considers five important points—organization, statistical needs, competition with road transport, elasticity in rates and charges to meet changing conditions and the need of the best publicity. *Journal of the Institute of Transport*, May, 1927, p. 324-336, with Discussion, p. 336-341.

The Real Progress of American Trade, by Calvin Coolidge. Railroads and other means of transport and communication in relation to distribution, p. 12. *Nation's Business*, May 20, 1927 (Extra Edition), p. 11-12.

A FEDERAL GRAND JURY at Cleveland, Ohio, has awarded Walter N. Steel, aged 50 years, locomotive engineman on the Pennsylvania, damages amounting to \$35,000, for injuries received in a wreck of the Gotham limited near Altoona, Pa., during February, 1926. Mr. Steel testified that his injuries had so unnerved him that he would be unable to serve as an engineman again.

Looking Backward

Fifty Years Ago

The Pennsylvania has put on a fast train from Chicago to New York over its own line and that of the Pittsburgh, Ft. Wayne & Chicago, which makes the run of 913 miles in 29 hours.—*Railroad Gazette*, May 25, 1877.

The Wabash is now trying the long-run system on its passenger conductors. On a typical schedule a crew leaves Quincy about 4 p. m., returning to Quincy on the afternoon of the fifth day after having covered a total distance of 928 miles.—*Railroad Gazette*, May 25, 1877.

Over 100 miles of the Kansas Pacific track in Central Kansas was covered with water in depths varying up to 12 ft. during the past week, though service was nowhere suspended for more than a day. Between Iowa City, Iowa, and Elmira on the Chicago, Clinton & Western the track sank out of sight through several cuts during a period of heavy rains. The Atchison, Topeka & Santa Fe bridge over one of the tributaries of the Arkansas river south of Sterling, Kan., was washed away on May 20 while the track near Ellinwood, Kan., and the bridge and culverts for a distance of four miles on either side were completely washed away. It is considered doubtful whether service on this line of the Santa Fe can be resumed for about 10 days.—*Railway Age*, May 31, 1877.

Twenty-Five Years Ago

The Ann Arbor and its system of ferries has been purchased by a syndicate in the interest of the Wabash as an investment venture.—*Railroad Gazette*, May 30, 1877.

The Seaboard Air Line has been granted permission to enter Birmingham, Ala., taking a route through Rockmart, Ga., from Atlanta, 177 miles, over the tracks of the East & West.—*Railroad Gazette*, May 30, 1902.

Notice has been given by the secretary of the American Railway Association that the per diem method of charging for the use of freight cars has received the required number of votes and that it will be effective on and after July 1.—*Railway and Engineering Review*, May 31, 1902.

In consequence of its success in handling the recent tour of Prince Henry of Prussia, the Pennsylvania has been commissioned by the government authorities to arrange the details of a tour which is to be tendered the French mission and the Rochambeau and La Fayette families.—*Railway and Engineering Review*, May 31, 1902.

Ten Years Ago

H. M. Adams, general traffic manager of the Missouri Pacific-St. Louis, Iron Mountain & Southern, has been elected vice president in charge of traffic.—*Railway Review*, May 26, 1917.

To supply steel rails for the railroads on the west front in France, the Canadian Government has stripped 135 miles of the Grand Trunk Pacific and 75 miles of the Canadian Northern west of Edmonton, where these roads parallel. The first rails sent to France in February were taken from the National Transcontinental.—*Railway Age Gazette*, May 25, 1917.

Cross-examination of railroad executives who testified before the Interstate Commerce Commission to urge a 15 per cent increase in freight rates was begun at Washington on May 23. Clifford Thorne, appearing for the National Shippers' Conference, tried to show that the plan of operating the railways as a national system during the war would result in great economies that would improve the earnings of the roads.—*Railway Age Gazette*, May 25, 1917.

Communications and Books

Teacher: "Norman, give me a sentence using the word 'diadem.'"

Norman: "People who drive on to the railroad crossings without looking diadem sight quicker than those who Stop, Look and Listen."—SELECTED.

The Missouri Pacific Lines now call the hungry passengers to the diner by means of musical chimes. This is a distinct improvement over having a raucous voiced waiter yelling his way through the train, particularly in the early morning hours, when sleep is sometimes more important even than food.

In answer to our invitation to readers who knew of railroad men with appropriate names to send them in to this department, C. A. Hall, bill clerk on the Minnesota, Dakota & Western at International Falls, Minn., asseverates that he knows a conductor whose name is Krummey and an engineman named Cole.

When the high water inundated the yards of the Illinois Central at Mounds, the switchmen there went about their duties in bathing suits. Even though none of them would qualify as Miss Illinois for the Atlantic City beauty show, they did a mighty good job under difficult operating conditions.

Fred Horton has retired as a train dispatcher on the Atchison, Topeka & Santa Fe and will devote his time to the unusual task of inscribing religious texts on hillsides along the right-of-way. Mr. Horton has, in his spare time, nearly completed painting a text 475 ft. long on the rocky face of a hill just north of Arkansas City, Kan.

Locomotives are law-abiding as a rule, but last week one went on a 15-minute toot in the Dearborn station in Chicago. The whistle jammed and for a quarter of an hour, the downtown district was filled with its piercing blasts. To date, dry agents have been unable to determine where the engine got its inspiration.

While railroading may not be adequately represented in the musical world, railroaders most certainly are. Most of us have heard the haunting melody produced by the Pullman Porters' Quartet, singing "Deep Rival" or some others of their folk-songs. The St. Louis Southwestern also boasts of its Cotton Belt quartet as being among the finest. This quartet is now on a tour which will take them to Cincinnati, Louisville, Bowling Green, Nashville, Chattanooga, Birmingham and Atlanta, advertising the Cotton Belt by music enroute.

While on the subject of railroad parlance, the following story is always good for a laugh. At a small country station a freight train pulled in and sidetracked for the passenger train. The passenger train arrived and pulled out; then the freight started to do its switching. A placid, well-dressed woman had alighted from the passenger train and was passing close to one of the freight brakemen when he yelled to his buddy: "Jump on her when she comes by, Bill, run her down by the elevator, cut her in two and bring the head up by the depot!" The lady picked up her skirts and ran for the station, yelling murder at every jump.

Railroads which take pride in the number of good things done for passengers over and above what is due them will have to look to their laurels. The Gulf, Mobile & Northern has entered the lists; a small road, comparatively, but making a fine showing when stated in good deeds per hundred million passenger miles. A young lady was a passenger on train No. 4. Near Latonia, Miss., she lost her hat out of the car window. Conductor Hall, on learning of it, wired back to freight train No. 52. Engineer Jimmie Stevens of the freight kept his eye open for the hat, found it, picked it up, turned it over to Agent Clem Lang; Mr. Lang telephoned to conductor Hall; hat restored to owner.

There seems to be no end to these safety verses. They go on and on like the telephone verses that continue to come into this

department. The most recent one relates what happened to Willie.

"I'll beat the train across the track,"
Said little Willie Peck,
"I'll give the good old boat the gas;
Just hang on for your neck."
Poor Willie just came raining down
In pieces from the sky
He didn't win, he didn't lose—
You see, it was a tie.

J. A. McDougal, superintendent of the Chicago, Rock Island & Pacific at Little Rock, Ark., has an enviable reputation for veracity and he vouches for the following flood incident. Moreover, his entire work train crew supports him. It appears that Superintendent McDougal was marooned on a work train in the midst of the flood for several hours. During that time all sorts of animals, wild and domesticated, also found the train a place of refuge. According to Mr. McDougal, a small rabbit was attempting to reach the train, but having a bad time of it in the water. Suddenly, a large dog swam up to the rabbit, took him by the neck as carefully as a cat does her kittens and swam with him to the work train, where he deposited him in safety and unharmed.

What We Love Most About Our Road

"During an inspection trip over the Minneapolis & St. Louis during April, 1926," writes John E. Muhlfield, "I attended one of their 'Booster Club' meetings at Marshalltown, Iowa. This meeting consisted largely of an entertainment and a dance. During the entertainment, Miss Geraldine Keyser, about six years old, recited this piece of poetry, 'The Pay Check'—and it made the biggest hit of anything that was pulled off."

THE PAY CHECK

Two times each month at our house,
We have the bestest day,
It's pretty near like Christmas time
When Dad brings home his pay.

The days right after pay day,
We have lots more to eat,
The store man brings such bundles in,
Ma's cookin' can't be beat.

But then it dwindles by degrees,
The thought just makes me shiver,
Instead of having tenderloin,
The meat man brings us liver.

And when I say, "I'm hungry, Ma,
My stomach's just a wreck,"
She says, "The bills must be kept down,
'Til Dad gets his next check."

And when that blessed day arrives,
Ma gets up with a grin,
And Pa he shaves his whiskers,
And most cuts off his chin,

And Sis, she cleans herself all up,
And scrubs my brother's neck,
And then we all sit down and wait,
'Til Dad brings home his check.

I'm mighty glad I'm here tonight
To boost our railroad dear,
I love you all, from Mr. Nash,
To every engineer.

The wipers and the section boss,
I love you all, but Heck,
The most I love about our road,
Is the little old pay check.

NEWS of the WEEK



Boston & Albany—Photo by C. Parker

THE SHOPS of the Chicago & Alton at Bloomington, Ill., were closed on May 14 for 30 days because of the decrease in traffic resulting from the coal strike and the floods in the Mississippi Valley. The coach and paint departments will remain in operation. About 1,300 men are affected.

THE CHICAGO, MILWAUKEE & ST. PAUL has filed suit in the United States district court at Chicago to recover \$1,500,000 which it alleges was collected in excess taxes and interest by the United States. The brief sets forth that \$1,000,000 was paid on profits shown by the corporation's accounts for the years 1918, 1919 and 1920 when the railroad was under federal control, while the railroad's books for the three years do not show profits. In addition, the suit seeks to recover interest on certain moneys collected by the government.

A. R. A. Directors Meet

The board of directors of the American Railway Association on May 26 approved the Car Service Division's report which estimates that revenue freight loadings in 1927 will be 52,762,737 cars. The report also said that owing to the fact that efficiency in the use of freight cars is now the greatest ever attained "the Car Service Division believes that it is possible to handle the traffic of this country for some time to come with a total decrease in the ownership of open top and box cars of at least 100,000," providing present efficiency is continued and average load per car is increased one ton.

The board announced the resignation of Donald D. Conn as manager of public relations of the Car Service Division and the appointment of H. G. Taylor, chairman of the Nebraska State Commission, as his successor.

New York State Highway Crossings

The Public Service Commission of New York has just added 21 projects to its extensive program for the elimination of grade crossings of highways and rail-

roads. Following are the names of the roads affected and of the towns in which the crossings are located. Delaware & Hudson, Whallonsburg; Saratoga Springs; Calcour (two); Chazy (two); Rouses Point. (two); Harkness (two); Peru (two). New York Central, Peekskill; Cold Spring. (two); Phillipstown (Storm King); Fishkill. Pennsylvania, Aurora. Erie, Avon. On the Delaware & Hudson and Hudson Valley, Saratoga Springs.

Railway Magazine Editors

The American Railway Magazine Editors' Association is to hold its fifth annual convention at Hotel Roosevelt, New York, on June 2 and 3. Miss Margaret T. Stevens (B. & O.), secretary of the association, announces that Bruce Barton and Barton W. Currie are expected to speak.

Former Commissioners in Law Practice

So many former members of the Interstate Commerce Commission are now engaged in private practice as lawyers that it is becoming almost unusual to find one of the bigger cases before the commission in which one of them is not enrolled among the list of counsel. Edgar E. Clark has been so engaged for several years and represented the St. Louis & O'Fallon Railway in the proceedings relating to its valuation for recapture purposes. C. C. McChord, who resigned a little over a year ago, participated in the hearings in connection with the motor transport investigation last year and is among the counsel for the Chesapeake & Ohio in the proceedings on its application for authority to control the Erie and Pere Marquette. Mark W. Potter has also appeared recently as counsel in several different cases before the commission and Frederick I. Cox, whose term expired at the end of 1926, has become a member of a Washington law firm, although one not conspicuous in practice before the commission. A large number of former examiners and attorneys for the commission are engaged in private practice or have become connected with railroad law departments.

Managers and Enginemen in East Confer

The Conference Committee of Managers of eastern railroads went into session May 23 with representatives of the Brotherhood of Locomotive Engineers to consider the men's request for a 15 per cent increase in wages. The parties continued in session this week and are expected to do so for several days more, although the representatives of the men are desirous of reaching some basis of understanding which they may report to the members of the organization at its annual convention which takes place June 6. Although there were rumors to the effect that the amount of the increase sought might be satisfactory all around when put at 7½ per cent with an agreement to be worked out as to working rules, it was stated by those in conference that there was no basis for such a report. J. G. Walber is chairman of the conference committee of managers, and A. Johnston, grand chief engineer of the Brotherhood, is representing the men.

Women in Railway Service

More than 61,000 women railroad employees are involved in the change that has occurred within recent years in the positions of women in industry and politics—a change that it is probable will be pronounced by future historians as one of the most momentous revolutions in the history of human society, declared Samuel O. Dunn, editor of the *Railway Age*, in speaking before the annual dinner of the Railway Business Women's Association of the Twin Cities at Minneapolis, Minn., on May 21.

Of the women now employed by the railroads of this country, some 51,000 are engaged in clerical, stenographic and similar kinds of work, but there are still a good many who perform tasks requiring every form of exertion from manual labor to that of official administration, continued Mr. Dunn. Women secretaries and chief clerks have demonstrated a high degree of capacity for aiding railway officers in the performance of their duties, and improvements in many lines of work reduce the amount of physical exertion required and

increase the value of the qualities possessed by women. It is easily conceivable that there will be a steady increase in the number of women in many branches of railway service.

The future of the railways will be determined largely, he said, by the way they are regulated by the government, and this, in turn, by the sentiment of the voters, and, in consequence, the sentiment of women will have an increasing influence on railway legislation, development and operation.

Turning his attention to the general railroad question, Mr. Dunn declared it to be the most important of the great unsolved economic problems. While railway service is now better and operation is more economically conducted than ever before, we are still engaged in a great struggle over the most fundamental questions as to the way in which the railways should be regulated.

"The railways have contended in the present wage arbitration hearing at Chicago that, because of the inadequate net return they are earning, they cannot afford to pay higher wages unless their freight rates, including those on farm products, are to be advanced," he said. "The employees contend that wages should be made what they claim would be reasonable regardless of the net returns the railways may earn or the effect that might be produced on the freight or passenger rates they might have to ask the Interstate Commerce Commission to let them charge.

"When such controversies arise there is always a strong tendency on the part of people of comparatively small means and income to assume that great corporations representing a large investment of capital, must be wrong. The railways of the United States have so many stockholders that each stockholder owns on the average only about \$10,000 of their stock, and derives from it an income only one-fourth as great as the average wage of a railway employee. During the last 20 years the average annual wage of railway employees has increased 177 per cent, while the average freight and passenger rates charged the public have increased only 47 per cent. The railways now have a capital investment of \$5,000 more for each person employed by them than they had 20 years ago, and it is this added capital, invested in improved facilities, that has enabled them to effect the great savings in labor, fuel and materials that have made it possible for employees to get such a large increase in their average wage; and in spite of this, for the public to now enjoy freight and passenger rates that have been advanced much less than the general advances that have occurred in wages and commodity prices."

If the increases in the efficiency and economy of railway operation are to be even greater in the future than they have been in the past, to provide for increased wages to employees and reduced transportation costs to the public, we must recognize that there must be a constantly increasing investment of capital in the railroads, concluded Mr. Dunn. This capital cannot be raised unless the railroads are allowed to earn attractive net returns, and such returns cannot be earned if wages and rates are to be regulated regardless of the effect on the earnings.

Traffic

The Sandy Hook route of the Central of New Jersey—fast steamboats, running between Cedar street, Manhattan, and Atlantic Highlands, N. J., 20 miles—on May 22, began its 68th summer season.

The Southern announces a two-hour train between Atlanta and Macon, 87 miles; the northbound train leaving Macon at 1:50 p. m. and the southbound leaving Atlanta at 1:25 p. m., Eastern time. These trains will take the place of the Suwanee River Special, between the cities named.

The Missouri Pacific is distributing 10,000 health posters in the flooded districts along its lines, suggesting precautionary measures to safeguard against disease. These measures include anti-typhoid inoculation, vaccination, boiling of drinking water and the taking of quinine as a protection against malaria. The posters were provided by three St. Louis business firms.

The Interstate Commerce Commission on May 24 suspended from May 25 to December 25 tariff schedules proposed by the railroads increasing the rates on grain and grain products from Central Freight Association, Western Trunk Line and Southwestern territories and from Ohio and Mississippi river crossings to Mississippi valley points. The tariffs would increase the rate from Memphis to New Orleans from 17 to 24 cents, that from St. Louis to New Orleans from 28½ to 33 cents and that from Omaha to New Orleans from 42 to 46½ cents, on traffic originating beyond.

"Welcome to Virginia" is the title of a new book which has been issued by the Norfolk & Western designed to attract summer travel to that road. The pamphlet is a handsome one, made up largely of pictures, the majority of which seem to be new. Each of the principal pleasure resorts is described in considerable detail—Virginia Beach, the Blue Ridge, Shenandoah Valley, Caverns of Virginia, Natural Bridge and Luray Caverns. Norfolk, Richmond, Roanoke, Bristol and other cities are briefly described, with much interesting historical data.

The thirteenth regular meeting of the Central Western Shippers' Advisory Board will be held in Casper, Wyo., on June 23, when reports on the prospective volume of business for July, August and September will be discussed. The matter of controlling the practice of peddling from railroad cars will be reported upon and the results of a survey being conducted to determine the need for increasing the storage facilities for perishable products will be presented. F. W. Sargent, president of the Chicago & North Western, is expected to address the meeting.

Flood Order Extended

The Interstate Commerce Commission on May 23 issued Service Order No. 45,

extending Service Order No. 44, recently issued on account of flood conditions in the Mississippi Valley, to authorize the Texas & New Orleans until further order to install and operate new service by water between New Orleans, La., and Galveston and Houston, Tex. The order provides that such water line when established shall be deemed the equivalent of the company's railroad line between such points during the life of the order, both as to rates and liabilities of the railroad carrier.

Large Casting Carried by Pennsylvania

A bed plate casting for a gas engine, weighing 254,000 lb., left Hamilton, Ohio, on April 26, over the Pennsylvania, for Youngstown, Ohio. It was made by the Hooven-Owens-Rentschler Company of Hamilton, and was destined for the Carnegie Steel Company's plant at Youngstown. This bed plate, together with the bracing, blocking and the two cars required, weighed 405,000 lb. The casting itself was 29 ft. 6 in. long, 15 ft. 5 in. high and 11 ft. 2 in. wide. Two special steel cars with capacities of 220,000 lb. each were used for the shipment. This is said to be the largest casting ever made.

Faster Time, N. Y., and Chicago

The Pennsylvania has made a reduction of one hour in the time of its Gotham Limited from Chicago to New York. The train leaves Chicago 9:15 p. m. (instead of 8:30) arrives in Pittsburgh 8:45 a. m.; New York, 7:10 p. m.; time through, 20 hours, 55 minutes. Westbound, "The Metropolitan" No. 25, leaves New York 8:05 a. m. and arrives at Chicago 7 a. m., one hour faster than heretofore. The Pennsylvania Limited, (westbound No. 5,) has also been quickened one hour between New York and Chicago; time through, 20 hours, 50 minutes.

The company announces a new train "The Juniata," from St. Louis to New York, leaving St. Louis at 4:40 p. m. and arriving in New York at 7:50 p. m.; time through, 26 hours, 10 minutes. This train will pass along the valley of the Blue Juniata river in the afternoon.

New Orleans Sleepers

The Illinois Central has rearranged its through sleeping car service from New Orleans, La., to Louisville, Ky., and Cincinnati, Ohio, and from Louisville to New Orleans, so that cars from these points are now being handled on the Panama Limited, thereby reducing the time four hours. The sleeping car which formerly left New Orleans at 8:30 a. m. for Cincinnati has been discontinued. Under the new schedules a sleeping car leaves New Orleans on the Panama Limited at 12:30 p. m. and arrives at Memphis at 9 p. m. and at Louisville at 7:59; and at Cincinnati via the Baltimore & Ohio from Louisville at 11:50

the next morning. Another car leaves New Orleans at 7:45 p. m., arriving at Memphis at 6:35 a. m., and Louisville at 5:40 p. m. Southbound, a car now leaves Louisville at 12:10 p. m., arriving at Memphis at 11:25 p. m. and at New Orleans at 9:30 a. m. Another car leaves Cincinnati on the Baltimore & Ohio at 7:25 p. m., arriving at Louisville at 9:50 p. m., where it is turned over to the Illinois Central and arrives at Memphis at 8:20 a. m. and New Orleans at 7:50 p. m.

Western Class Rate Hearing

The hearing on Western trunk line class rates, I. C. C. Docket 17,000, part 2, ex parte 87, which was opened at Sioux Falls, S. D., on May 16, was resumed at Omaha, Neb., on May 21 before Examiners William J. Kobel and Peter C. Paulson. At Omaha witnesses for the shippers claimed that manufacturers and jobbers along the Mississippi river and at points east possess a decided advantage over Omaha and Missouri river manufacturers and jobbers in placing their products in territory west of the Missouri river.

H. T. Bergen, assistant traffic manager of the Omaha Chamber of Commerce, testified that Omaha, by its geographical location, should be entitled to a rate advantage in placing products in territory west of the Missouri river, which advantage does not now exist. "We have found he said, 'that shippers in Chicago can ship to Lincoln, 55 miles west of Omaha, and Fremont, 35 miles from Omaha, at rates with which Omaha cannot compete successfully. A carload of canned soup can be shipped to Chicago, be reloaded into less than carload lots by a jobber there and then be shipped to any one of nearly 50 points at from one to thirty-seven cents per pounds cheaper than Omaha jobbers can offer the same service.' He presented exhibits illustrating his point with a number of other commodities.

The hearing was resumed at Lincoln, Neb., on May 23.

Faster Schedules

The Fort Pitt Limited, new train of the Baltimore & Ohio, between Pittsburgh, Pa., and Chicago, runs through in 10 hr., 36 min., westbound and 12 hr., 15 min., eastbound; leaves Pittsburgh 9:30 a. m., leaves Chicago 8:45 p. m.

The schedule of the Youngstown-New Castle express of the Pennsylvania, between Chicago and Pittsburgh, has been shortened one-half hour, and it leaves Chicago at 8 p. m. instead of 7:30 p. m. and arrives in Pittsburgh at 9:15 a. m.

The Michigan Central has established the "North Shore Limited" a 21-hour train between Chicago and New York which leaves Chicago at 9 p. m. Returning it leaves New York at 12:10 noon. These trains take the place of the Trans-Atlantic Limited, eastbound, and the Mohawk, westbound.

The Atchison, Topeka & Santa Fe, on June 12 will establish a train, "The Antelope," between Kansas City, Mo., and Ft. Worth, Texas, which will carry a sleeper from Kansas City to Ft. Worth and one to Oklahoma City, Okla. Re-

turning, the train will have a sleeper from Ft. Worth to Kansas City and two from Oklahoma City to Kansas City. The train will leave Kansas City at 10:10 p. m., arriving in Oklahoma City at 7:35 a. m. and Ft. Worth at 1:40 p. m. Returning it will leave Ft. Worth at 4:05 p. m., and Oklahoma City at 10 p. m., and arrive at Kansas City at 7:45 a. m.

Rates on Logs in Idaho

The Supreme Court of the United States has reversed the judgment of the Idaho Supreme Court (41, Idaho, 181) which affirmed an order of the Idaho Public Utilities Commission reducing Idaho intrastate rates for the transportation of logs. The court holds that the evidence introduced by the railroads was sufficient to warrant, if not to require, a finding that, as to the lines of all of them, i. e., the St. Paul, the Great Northern, the Northern Pacific and the Spokane & International, the rates in question were very low in comparison with the rates on other commodities, and that they were confiscatory as to the St. Paul and the Great Northern.

The Commission and the state court had refused to consider and give weight to that evidence because, as they held, the intrastate log rates were not to be dealt with separately, but were to be considered in connection with the interstate lumber rates, and because the carriers made no showing as to the gains or losses resulting from the interstate transportation.

The United States Supreme Court holds that this view cannot be sustained. "The carriers cannot maintain interstate lumber rates (higher than otherwise justified) by showing that they have inadequate returns from the intrastate transportation of logs. The State has no power to require petitioners to haul the logs at a loss or without compensation that is reasonable and just, even if they receive adequate revenues from the intrastate log haul and the interstate lumber haul taken together."—Chicago, Milwaukee & St. Paul v. Commission. Decided May 16, 1927. Opinion by Mr. Justice Butler.

Livestock Rates Investigation

The Interstate Commerce Commission has announced a comprehensive investigation of the whole system of livestock rates in the western district, under the Hoch-Smith resolution, with a view to bringing about a more harmonious adjustment and also, as a part of the general rate structure investigation, of the livestock rates, including those on horses and mules, in southern classification territory.

In its decision in the American National Livestock Association case recently the commission announced its intention of keeping the record open for further investigation, and it has now concluded to assign for hearing, with eight formal complaint cases, No. 17,000, its general rate structure investigation, insofar as it covers the interstate rates, and the intrastate rates under section 13 of the interstate commerce act, on edible livestock in the western district. This portion of No. 17,000 will be referred to as Part 9, Live-

stock, Western District Rates. Certain other complaints now pending will also be heard on June 30 at Salt Lake City, July 5 at Portland, Ore., and July 15 at Los Angeles, Calif.

The southern part of the proceeding, referred to as Part 9, Livestock, Southern Territory Rates, will also include several formal complaint cases, and is assigned for hearing on July 27 at Montgomery, Ala., and August 1 at Louisville, Ky.

Appendices are attached to both orders indicating the kind of information which the commission desires to have made a part of the record, including the following: territories within which uniform rate levels may properly obtain, rate of progression for distance scales, construction of rates between territories of different rate levels, whether rates throughout the western district should not be stated on a cents-per-hundred-pounds basis, and the extent of depression in the livestock industry.

Joint Rates With Barge Line Disapproved

Dismissal of complaints filed by the Inland Waterways Corporation, which had asked the Interstate Commerce Commission to require the establishment of through freight routes and joint rates via the rail lines and the proposed barge line of the Inland Waterways Corporation on the upper Mississippi river, is recommended in a report proposed by Attorney-Examiner John H. Howell, made public by the commission on May 24, on the ground that the proposal is not justified. Rates were asked from St. Paul and Minneapolis, Minn., and Fargo, N. D., to points in Illinois, Indiana, Iowa and Missouri, and vice versa, in connection with the barge line from Dubuque, Ia., to the Twin Cities.

Should the commission consider, however, that through routes and joint rates are justified, it should limit them, the report says, as to both the Twin Cities and Fargo, to points of origin and destination which come within the rule of circuitry heretofore laid down, and should find that a reasonable division of the through rates will be 60 per cent to the rail lines and 40 per cent to the barge line.

The barge line, the report says, "is not interested in reasonable rates, but only in rates made sufficiently lower than the existing rail rates to enable it to secure traffic. Giving full consideration to the desirability of fostering water transportation to the maximum degree consistent with sound economy in transportation, the question arises whether the proposed operations of the barge line will be economical. In determining this, the evidence presented by the barge line is not helpful.

"From the point of view of the rail carriers, the effect of the barge line's proposals is that they maintain their facilities to the same extent as at present; that they continue to handle the traffic, which because of its nature or because of the lowness of the rates, is not desired by the barge line; that during the winter months, when transportation conditions are the most difficult, they handle the entire volume of traffic; and that on traffic inter-

changed with the barge line they accept divisions, which appear hardly adequate for the service they would be called upon to perform."

Port Rates on Grain and Products Found Not Unlawful

Export rates on grain and grain products from western points to Boston and New York were found not unreasonable or otherwise unlawful in a decision by the Interstate Commerce Commission made public on May 25 after further hearing in the port differential case, in which the Maritime Association of the Boston Chamber of Commerce and others had sought the removal of the so-called port differentials under which the Boston rates are higher than those to and from Baltimore and Philadelphia. In its original report in this case the commission found that in general the port differentials do not result in unreasonable or unduly prejudicial or preferential rates but expressed the view that the application of the differentials to movements of grain and grain products from much of the territory west of the Mississippi river to the north Atlantic ports for export is not warranted in view of Boston's slight disadvantage in distance in comparison with the total haul.

Complainants later joined with the New York Produce Exchange in petitioning for a re-opening of the case as to export rates on grain and products, including the ex-lake rates from Buffalo to New York. No order giving effect to the views expressed in the former report was entered, the report says, "because of doubt as to our power to revise the combination through rates from western territory upon a complaint which involved only the factors thereof applying east of the gateways, and because, with respect to the ex-lake rates, it could not be found that they were too high or unduly prejudicial."

In the report on rehearing, by Commissioner Eastman, it is stated that "upon the record before us we find that the rates assailed and considered at the further hearing to Boston, New York, Philadelphia and Baltimore are not unjust, unreasonable or unduly preferential or prejudicial," and that the complaint as amended will be dismissed, but that as to the ex-lake rates the record amply justifies a conclusion that the line-haul rates to the water-front elevators at New York, Philadelphia and Baltimore should be identical and that the maintenance of the same rates to the water-front elevators at Boston would not be unlawful. "If we were to prescribe maximum or minimum reasonable export rates on ex-lake grain from Buffalo," the report says, "we would in either case prescribe identical rates to New York, Philadelphia and Baltimore, confining such rates to the service ending with the spotting of the car at the water-front elevator and requiring any further terminal service to be covered by a special charge or charges. . . . But it has not been shown that the present rates are higher than maximum reasonable rates or lower than minimum reasonable rates, nor does the record enable us to determine what the maximum and minimum limits of reasonableness would be."

Dallas Grain Rate Investigation

Short line railroads of the Southwest began presentation of their case in the investigation of the rate structure of grain and grain products before Commissioner Meyer and Examiner Mackley at Dallas, Tex., on May 12. J. W. Frazier assistant general freight agent of the Gulf, Texas & Western, testified that short line railroads cannot absorb in other classes of commodities the losses which would result from the reduction of the grain freight rate. Even increases in other traffic, namely refined oil and fresh fruits would not absorb the loss, he said. Mr. Frazier also pointed out the fact that pipe line competition is cutting into the crude oil traffic.

C. J. Turpin, vice-president and general manager of the Beaver, Meade & Englewood, declared that the unusually heavy grain crop of his territory, which caused his road to handle 1,600 cars during 1926, brought a profit, but that the grain movement over this line lasts for about two months and the operation during the remainder of the year is carried on at a loss.

The arbitrary system of rate making is the most reasonable and fair to short and financially weak lines, testified Vernon Gaston, general freight agent of the Ft. Smith & Western. This system helps the short lines make expenses, their movement usually being less than 50 per cent of the density of movement over longer lines.

R. R. Simpson, assistant general freight agent of the Gulf, Colorado & Santa Fe, pointed out that at present in handling grain and grain products the carriers of Texas intrastate traffic are forced to grant more special privileges than is the case with any other character of traffic. Among the special privileges listed by Mr. Simpson were those of several official inspections while the grain is en route, storage in transit, which includes threshing on some grains and the filling in a shipment of raw grain with the manufactured product.

On May 17, H. W. Moorhouse, president of the Brookmire Economic Service, New York, discussed the economic factor in grain production and its relation to other industries. He attempted to show that an increase in grain production was brought about by the war, and that later the cost of production was lowered by more general use of machinery, such as the "combine" thresher and harvester. At first the producer benefited from the lowered cost of production, said Mr. Moorhouse, but as the market became stabilized the consumer received his share of the benefits. The more stable the cost of production the less burdensome are adjustments, he declared in referring to the stabilization in marketing and distributing their adjustments in prices and freight rates. Using the five-year period of 1909 to 1913, as a prosperous and basic time, Mr. Moorhouse compared the purchase power of the farmer's dollar through various periods up to the present to show that fluctuations were soon adjusted and that the purchasing power remained upon a fairly stable basis, he explained that the basis for his estimates were fixed on products actually sold by the farmer for cash and did not include those commodities the farmer consumed without their leaving the farm.

Foreign

South African Railways Head to Go to Rhodesia

Sir William Wilson Hoy, K. C. B., general manager of the South African Railways, will resign, to become chairman of the Rhodesian Railway Commission effective April 1, 1928. Sir William entered the service of the North British Railway Company in 1880. In 1889 he entered the employ of the Cape Government Railways. In 1895 when he was appointed chief clerk to the chief traffic manager, and in 1896, representative of the Cape Government in Johannesburg. He held the post of assistant traffic manager from 1897 to 1898. In June, 1900, he was appointed traffic manager of the Imperial Military Railways, and he became chief traffic manager of the Central South African Railways in 1902. After holding the position of assistant chief manager of this railway from 1909 until 1910 he was appointed general manager of the railways of the Union of South Africa. In December, 1914, he was appointed director of military railways with the rank of colonel. The Rhodesian Railway Commission, of which he becomes chairman next year, is a commission set up by an agreement between the Rhodesian government and the British South African Company.

English Railways in 1926

The financial results of operation of the group railways of England in 1926—i. e., the London, Midland & Scottish, the London & North Eastern, the Great Western and the Southern—showed even a less favorable return than was expected a year ago in reporting results for the preceding year. Reference was then made to the depression in the coal trade and in the iron and steel industry and also in the menace of motor competition with passenger traffic and it was pointed out that although there were indications that some improvement might be expected in 1926, the coal problem made everything look uncertain. The first quarter of 1926 seems to bear out the views of those who were inclined to be slightly optimistic. The results of the four group companies in aggregate showed an increase as compared with the first quarters of 1925, of \$1,100,160 in passenger revenues and of \$4,122,800 in freight revenue, a total of \$5,122,440. However, by the end of the year there was a decrease of \$134,388,440, or 14½ per cent, as compared with the previous year, toward which passenger traffic contributed \$42,796,880 and freight traffic \$91,591,560. In addition there was a decrease in gross receipts from other business amounting to about \$7,000,000.

In the four years since amalgamation capital expenditures have increased by \$130,000,000. The estimate of expenditure to be made in 1926 at the beginning of the year was a little less than \$35,000,000, but due to curtailment of expenses by the different roads this figure was brought down.

Comparisons of gross receipts indicate that in three years the revenue of the group companies has diminished about one-sixth. In round figures the London Midland & Scottish gross revenue has decreased about \$70,000,000, the London & North Eastern about \$65,000,000; the Great Western about \$35,000,000; and the Southern about \$5,000,000. The Southern was the only one of the companies to improve its gross revenue in 1924 and 1925. Declines are attributed, according to the railways' report, to several causes among which are lower rates, both freight and passenger, the decline in export coal trade, the depression in the iron and steel industry, motor vehicle competition, and the general and miner's strikes in 1926. The Ministry of Transport reported the gross receipts of the group companies in 1922 prior to their amalgamation amounted to approximately \$962,000,000 so that the decrease over a period of four years is a little less than \$250,000,000. However the companies were able to make some saving in operating expenses in 1926, the saving amounting to a little less than \$60,000,000, and yet this left a net revenue of more than \$85,000,000 below that of 1925, the net revenue for 1926 amounting to approximately \$80,000,000. The ratio of operating expenses to income averaged 90.68 per cent for the companies as a whole, varying from 84.41 per cent on the Southern to 93.91 per cent on the London & North Eastern. The returns on the capital investment for 1923, 1924, 1925 and 1926 were as follows:

	1926	1925	1924	1923
	Per Cent	Per Cent	Per Cent	Per Cent
L. M. S. . .	1.49	3.31	3.49	3.72
L. N. E. . .	0.95	2.53	2.96	3.60
G. W. . . .	1.81	3.39	3.58	4.14
Southern . .	2.56	3.39	3.37	3.45

With regard to passenger traffic decrease the railways report that the greatest decline had been in the third class traffic, where the London Midland & Scottish lost 40,000,000 passengers, the London & North Eastern over 30,000,000 passengers, the Great Eastern 14,000,000 and the Southern 13,000,000. They report that the general strike afforded an opportunity for motor vehicle operators to make a fresh attack on traffic hitherto carried by rail and also that the curtailment of train service to conserve coal supplies still further weakened the railways in their fight against motor competition.

With relation to freight traffic it was shown that revenue per ton remained fairly constant; however, coal tonnage diminished by 88,000,000 tons, general merchandise by 8,500,000 tons, other minerals by 17,000,000 tons and the number of live stock declined by 600,000 head.

Figures showing the net return on the investment for 1926, 1925 and 1913 show that 1926 declined about 50 per cent as compared with 1925 and about 70 per cent as compared with 1913.

THE SANDY HOOK route of the Central of New Jersey—fast steamboats, running between Cedar street, Manhattan, and Atlantic Highlands, N. J., 20 miles—on May 22 began its 68th summer season.

Equipment and Supplies

Locomotives

THE NORFOLK & WESTERN will build 30, 18,000-gal. tenders at its Roanoke shops

THE GREAT NORTHERN is inquiring for 10 electric locomotives to be of the 2-6-6-2 type.

THE DELAWARE, LACKAWANNA & WESTERN has ordered 10 three-cylinder Mountain type locomotives for freight service and five 4-8-4 type locomotives for passenger service from the American Locomotive Company. Inquiry for 15 locomotives was reported in the *Railway Age* of April 9.

THE CHICAGO, NORTH SHORE & MILWAUKEE has ordered two 65-ton electric locomotives from the General Electric Company which will operate either from a trolley or from the storage batteries which they carry. The storage batteries, which will be charged from the trolley, are being furnished by the Electric Storage Battery Company.

Freight Cars

THE WESTERN PACIFIC is inquiring for 40 dump cars of 30 cu. yd. capacity.

THE CHICAGO, MILWAUKEE & ST. PAUL is inquiring for five flat cars.

THE LITCHFIELD & MADISON is asking for prices on repairs to 247 gondola cars.

THE MINNESOTA STEEL COMPANY, Morgan Park, Duluth, Minn., is inquiring for six dump cars of 30 cu. yd. capacity.

THE FRUIT GROWERS EXPRESS has ordered 50 underframes from the Bethlehem Steel Company. This is in addition to 300 ordered from the Ryan Car Company as was reported in the *Railway Age* of May 14.

Passenger Cars

THE CHICAGO, BURLINGTON & QUINCY is inquiring for four lounge cars.

THE NORFOLK & WESTERN will ask for bids on the immediate construction of 25, 60-ft. all-steel mail storage cars.

THE READING is inquiring for 2 baggage-horse cars. This company is also inquiring for 15 steel baggage cars, as was reported in the *Railway Age* of May 7.

THE PAULISTA RAILWAY of Brazil, has ordered 3 parlor cars, 2 chair cars, 2 mail cars, 7 first class coaches and 6 second class coaches from the American Car & Foundry Company.

THE NEW YORK, NEW HAVEN & HART-

FORD has ordered 20 baggage cars from the Osgood Bradley Car Company. Inquiry for this equipment was reported in the *Railway Age* of April 16.

THE ERIE is now inquiring for four all-steel dining cars. In the *Railway Age* of April 2 it was reported that the Erie would buy this equipment and 25 suburban passenger coaches and 25 express cars.

THE DELAWARE, LACKAWANNA & WESTERN has ordered 20 milk cars from the Standard Steel Car Company, 10 express cars from the American Car & Foundry Company and 2 combination mail and baggage cars from the Pullman Car & Manufacturing Corporation. Inquiry for this equipment was reported in the *Railway Age* of April 9.

Iron and Steel

THE READING is inquiring for 200 tons of steel for bridges.

THE NORFOLK & WESTERN is inquiring for 100 tons of steel for bridges.

THE CHESAPEAKE & OHIO has placed an order for 120 tons of steel for use in West Virginia.

THE NEW YORK CENTRAL is inquiring for 150 tons of steel, also for 1,200 additional tons for bridges in Indiana.

THE ERIE has ordered two transfer bridges involving 750 tons of steel from the Steele & Condict Company, Jersey City, N. J.

THE NEW YORK, NEW HAVEN & HARTFORD has ordered 175 tons of steel for a bridge in the Borough of the Bronx, from the Bethlehem Steel Company.

THE SOUTHERN has ordered 1,400 tons of steel for a bridge to carry its tracks, in connection with grade crossing elimination work at Greensboro, N. C.

Machinery and Tools

THE CANADIAN PACIFIC has ordered a 6-in. vertical shaper from the Niles-Bement-Pond Company.

THE BOSTON & MAINE has ordered two 6-ft. multi-duty radial drills from Manning, Maxwell & Moore, Inc.

THE ELGIN, JOLIET & EASTERN has ordered one 20-ton, 71-ft. span electric overhead crane from the Niles Crane Corporation.

THE BALTIMORE & OHIO has ordered a 50-in. heavy duty engine lathe, a 2½-in. heavy duty forging machine and a micro internal pump grinder from Manning, Maxwell & Moore, Inc.

THE DELAWARE, LACKAWANNA & WESTERN has ordered a 90-in. Putnam journal

lathe and quartering machine, a 54-in. Putnam coach wheel lathe, a Putnam 46-in. gap lathe, a 32-in. shaper, a link grinder and a Micro cylinder grinder, from Manning, Maxwell & Moore, Inc.

THE ATCHISON, TOPEKA & SANTA FE is inquiring for one 30-in. heavy pattern upright drill, one 30-in. crank shaper, one 20-in. upright drill, one twist drill grinder, one 4-ft. radial drill, one 3-in. by 24-in. double dry grinder, one 16-in. by 6-ft. portable lathe, one 24-in. by 12-ft. heavy duty engine lathe, and one 51-in. vertical heavy duty boring mill.

THE CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA is inquiring for one four-spindle drill, one 42-in. by 42-in. by 10-ft. planer, one bending brake, one 42-in. upright drill, one 36-in. upright drill, one 18-in. by 8-ft. engine lathe, one power hammer, one double-end dry grinder, one milling machine, one upright drill with 20-in. swing, one 48-in. car wheel borer, one circular shear, one punch and slotting machine, one 2-in. by 24-in. flat turret lathe, one 16-in. by 8-ft. toolroom lathe, and one 24-in. by 10-ft. engine lathe.

Signaling

THE DENVER & RIO GRANDE WESTERN has contracted with the General Railway Signal Company for the installation of automatic block signals, the APB system, between Gypsum, Col., and Watts, 34 miles; an extension of the work already going on between Gypsum and Palisade.

FREDERICO ROSSORILE of Rochester, Pa., a crossing watchman of the Pennsylvania Railroad, was the recipient in Philadelphia on May 5 of the heroic service medal granted by the directors of that road to employees who perform notable acts of bravery. Mr. Rossorile, on August 19 last, saved the life of C. C. Monticue of Rochester, who proceeded to pass over the crossing in the face of an approaching passenger train. General W. W. Atterbury, president of the road, who presented the medal, at the same time presented medals to the three men heretofore noted in these columns, who saved lives and property at Titusville, Pa., on December 19—Frederick Lintner, James B. Deegan and Frank W. Geary.

PRESIDENT COOLIDGE does not understand that the policy of promoting railroad consolidation has been given any definite check by the commission's decisions in the Southwestern and Nickel Plate cases, it was stated at the White House on May 20. Although he had not yet read the Kansas City Southern decision it was stated that he was of the opinion that the commission's statements might serve to clarify the rules which it believes should be followed and that another attempt might be made, as in the case of the Van Sweringens. It was recalled that the President, in messages to Congress, had indicated his position as to railroad consolidations and that he believes that mergers on fair and just terms will be of benefit to the public.

The Mummert Lumber & Tie Company has moved its general offices to the Pure Oil building, 35 E. Wacker drive, Chicago.

The Whiting Corporation, Harvey, Ill., has appointed Brazelton, Wessendorf & Nelms, Inc., Houston, Texas, its sales agent for southeastern Texas.

William duPont, of Wilmington, Del., has been elected a director and chairman of the executive committee of the Miller Train Control Corporation, Staunton, Va.

The Dayton Manufacturing Company, Dayton, Ohio, has opened a new office at 25 Church street, New York City, in charge of Joseph Leidenger, vice-president.

Walter L. Graser, sales engineer of the Truscon Steel Company, with headquarters at Omaha, Neb., has been appointed manager of the Tulsa, Okla., office.

A. L. Bliss, district sales manager of the southeastern territory of the Buda Company, with headquarters at Jacksonville, Fla., has been transferred to Atlanta, Ga.

The Adams & Westlake Company, Chicago, has awarded a contract to the Ralph Sollitt & Sons Construction Company for the construction of a one and two-story plant at Elkhart, Ind.

G. E. Wearn has been appointed central station sales manager of the Westinghouse Electric & Manufacturing Company, and will be located in New York. Since joining the Westinghouse Company, eleven years ago, Mr. Wearn has devoted his time to sales engineering work in the power department and central station division.

H. D. Conkey & Co., Mendota, Ill., has appointed the George F. Crivell Company, Buffalo, N. Y., its representative for that territory, the Porter & Cole Company, Houston, Texas, its representative for Texas, Oklahoma and southern Kansas, and Colwell & McMullin, Boston, Mass., its representative for eastern Massachusetts.

F. H. Landwehr, secretary of the Electric Auto-Lite Company, Toledo, has also been elected president of the Prest-O-Lite Storage Battery Corporation, Indianapolis, Ind. J. H. McDuffee, general sales manager of the Prest-O-Lite Company, has been elected vice-president, while J. B. Motley, credit manager of Prest-O-Lite Company, has been elected secretary. J. B. Fenner, formerly associated with Price-Waterhouse Company, New York, has been elected treasurer.

The Economy Equipment Corporation, the LaCled-Christy Clay Products

Supply Trade

Company, the A. P. Green Fire Brick Company and the Evens & Howard Fire Brick Company have organized the Economy Arch Company, with offices in the Railway Exchange building, St. Louis, Mo., and Broad Exchange building, New York City, for the manufacture, sale and service of Economy locomotive arch and furnace brick. The officers of the company are as follows: J. C. Chapple, president; A. F. Stark, vice-president, and W. J. Westphalen, secretary-treasurer. The directors are: J. L. Green, C. H. King, A. P. Green, J. C. Chapple, A. F. Stark, and J. E. Ames.

B. A. Clements, president of the Rome Iron Mills, Inc., has been elected president of the American Arch Company with headquarters at New York, succeeding H. B. Slaybaugh, who has re-



B. A. Clements

signed. A sketch of Mr. Clement's career was published in the *Railway Age* of July 3, 1926. Lee Deutsch has been elected president of the Rome Iron Mills, Inc., with headquarters at New York, succeeding Mr. Clements.

The St. Louis Car Company, St. Louis, Mo., is completing a new steel fabricating and erecting shop of modern type, 1,000 ft. long and 135 ft. wide, built in two bays with two 10-ton traveling cranes in each bay. The shop is well lighted, it is of steel construction, erected on a low concrete foundation and the sides and roof bays are glazed with Fenestra steel sash. Raw material, steel plates and shapes are protected from the weather in a completely enclosed building, constructed for the purpose, forming an L at the lower end of the shop, and this building is also equipped with an overhead crane and runway for handling materials. Shears, presses and punches are at the lower end of the shop where the material is prepared for fabrication. There are four tracks on which the cars are erected, being built on steel jigs on concrete

bases, perfectly aligned and surfaced for accurate construction. Either freight cars or passenger equipment can be produced. When these cars are turned out at the upper end of the building they are ready for the finishing and paint shops.

Obituary

Benjamin J. Taussig, one of the founders of the Abeles & Taussig Lumber & Tie Company, St. Louis, Mo., died in that city on May 15, following an illness of nine months. Mr. Taussig was born in St. Louis on March 23, 1855, entering railway service at the age of 18 as a clerk. Five years later he helped to found the company which now bears his name, retiring from active participation in the business in 1887.

Waren S. Abel, purchasing agent of the Yale & Towne Manufacturing Company, Stamford, Conn., died on May 14, at Stamford. Mr. Abel was born at Bozrah, Conn., on October 25, 1863. After the completion of a course at the Eastman Business College, Poughkeepsie, N. Y., and experience in the textile business at Norwich, Conn., Mr. Abel entered the service of Yale & Towne in 1891. In 1898 he was promoted to purchasing agent.

Frederick Mather Waterman, treasurer of the United States Steel Corporation, New York, died at his home in Mahwah, N. J., on May 21. Mr. Waterman was born on January 20, 1872, at Wheaton, Ill. He was educated in the public schools at Westside, Iowa, and Iowa Business College, Des Moines. At the age of sixteen he entered the service of the Merchants' Loan & Trust Company Bank, Chicago, where he remained until 1902, when he went with the United States Steel Corporation as cashier. In November, 1919, Mr. Waterman was appointed assistant treasurer of the corporation and since April, 1922, had served as treasurer.

Trade Publications

DIXON CENTENNIAL.—The business philosophy of the Dixon Company is interestingly set forth in a recital of business victories and tribulations under the title of "A Tale of Yesterday, Today and Tomorrow," written by Floyd W. Parsons on the occasion of the one hundredth anniversary of the Joseph Dixon Crucible Company, Jersey City, N. J.

ELECTRIC PLANT.—The American Brown Boveri Electric Corporation plant, located at Camden, N. J., is described in a 16-page illustrated pamphlet issued by that company. Information is also included on organization and products, particular emphasis being placed on its most recent achievements in the power, railroad, railway, dredge, harbor, marine and industrial fields. The pamphlet is designated as No. DM 10,000.

Construction

Pennsylvania's Newark Plans

The Pennsylvania has announced that it has placed in the hands of Mayor Thomas L. Raymond, of Newark, N. J., its plans for proposed improvements in that city. These include the construction of a new passenger station on the north side of the Pennsylvania tracks between Market and Canal streets. Upon the completion of these new facilities, Manhattan Transfer, where connection is made with Hudson tunnel trains to downtown New York, will be abandoned. The railroad company's communication to Mayor Raymond states that it will agree to make these improvements in connection with arrangements between the city and the Public Service Corporation (an operator of trolley cars and buses), providing for adequate street transit facilities. The western half of the Pennsylvania's new station, which will be of appropriate architectural design, will be used by passengers for local and main line trains, and the eastern part will be used by passengers for the rapid transit service to Jersey City and downtown New York, provided jointly by the Pennsylvania and the Hudson & Manhattan tubes.

The station will be served by eight tracks, six for Pennsylvania trains and two for the rapid transit trains. There will be six platforms. Seven of the tracks and five of the platforms will be placed approximately at the level of the present tracks, and one track and one large platform will be constructed about 18 feet above the present track level.

ATCHISON, TOPEKA & SANTA FE.—Bids close on May 31 for the construction of a 40-stall reinforced concrete and brick roundhouse, a planing mill and lumber shed, a one-story apprentice school, a two-story brick locker building, a one-story office building and a brick ice house at Emporia, Kan.

CANADIAN NATIONAL.—A contract for the construction of a passenger station at Edmonton, Alta., has been awarded to the Permanent Construction Company, Edmonton, at a cost of about \$500,000.

CHICAGO, ROCK ISLAND & PACIFIC.—A contract for the construction of a water-treating plant at Marion, Kan., having a capacity of 500 gal. per min., has been let to the Railroad Water and Coal Handling Company, Chicago, at a cost of about \$30,000. Bids will close on June 2 for the construction of additional locomotive repair shop facilities at Silvis, Ill., at an approximate cost of \$125,000.

GREAT NORTHERN.—A contract has been awarded to Guthrie & Co., of St. Paul, Minn., for the construction of a cut-off between Winton, Wash., and Leavenworth, via Plain, at a cost of about \$4,000,000. This project, which is planned for completion simultaneously with the Cascade tunnel on October 30, 1928, involves the driv-

ing of three tunnels and the bridging of the Wenatchee river. South of Plain the route will follow Chumstick creek.

GULF COAST LINES.—A contract has been awarded to the Sumner Sollitt Company for the construction of a reinforced concrete, steel, and brick freight station at Harlingen, Tex., at an approximate cost of \$57,000. Included in the contract is a concrete platform covered with a steel frame shed. Offices will be located on the second floor of the station.

MISSOURI PACIFIC.—Plans of this company for the construction of a temporary bridge at the site of the Baring Cross bridge over the Arkansas river which was destroyed by recent floods have been abandoned and application will be made to the War Department asking approval of the specifications for a permanent structure. Present plans call for the construction of a bridge which will have a 60-ft. span, a 115-ft. span, a 185-ft. lift span to give 175-ft. maximum horizontal clearance, three 185-ft. spans, a 115-ft. span and a 30-ft. span. Vertical clearance of the lift span in the raised position will be about 75 ft. It is estimated that the cost of the new bridge will be about \$1,500,000.

NEW YORK CENTRAL.—This road is planning to carry out improvements at Port Clinton, Ohio. The work will include the construction of a cut-off about two miles long and the elevation of its tracks in the village of Port Clinton eliminating grade crossings. This project has been under consideration since about 1912. Delay was due to the time needed to secure the necessary right-of-way. Part of the improvement to its line was carried out several years ago when the railroad built a 4-track lift bridge over the Portage river. The cost of the contemplated improvement will be approximately \$2,000,000 and the new line will be about 1,500 ft. shorter than the old one and will eliminate a curve that caused reduction of speed at this part of the line. It is expected that work will be completed in 1928.

NORTHERN PACIFIC.—The Interstate Commerce Commission has issued a certificate authorizing the construction by this company of an extension from a point on its Glendive-Sidney branch about 2 miles west of Glendive, Mont., to Circle and Brockway, Mont., approximately 62 miles, and in the same decision denied the application of the Montana Eastern, a subsidiary of the Great Northern, for authority to build from Richey to Circle, 33 miles, and from Circle to Brockway, 12 miles. The Chicago, Milwaukee & St. Paul originally opposed both applications but later changed its position and asked that any certificate issued in favor of either applicant be so conditioned as to permit it to operate over the line between Circle and Brockway in connection with an extension of its line. The Great Northern had suggested that the

Northern Pacific build from Glendive to Lindsay and that it build from Richey to Brockway, and also offered to permit the Northern Pacific to operate over its line from Newlon Junction to Brockway, but the Northern Pacific objected to both proposals.

PENNSYLVANIA.—A contract has been let to M. J. McMenamin of Philadelphia, Pa., for the construction of an overhead bridge at Lewiston, Pa., which it is estimated will cost \$70,000. A contract has also been awarded to the Ferguson & Edmondson Company of Pittsburgh, Pa., for the construction of an undergrade bridge to eliminate grade crossing at Maine Street in Toledo, Ohio, which will cost around \$200,000. Another contract has been awarded to the Crane Contracting Company of Newark, N. J., for the construction of additional tracks for a produce yard at Kearny, N. J., at an estimated cost of \$285,000. A contract has been let to Louis Chevalier, Inc., of New York, for the construction of a sub-station at Sunnyside yard, Long Island City, New York, to cost about \$50,000.

OREGON, CALIFORNIA & EASTERN.—The Interstate Commerce Commission has granted an extension of time from May 3 to June 17 for the beginning of construction of new lines proposed by this company and the Central Pacific in southern Oregon which were authorized conditionally by the commission in a certificate dated May 3, 1926.

ST. LOUIS-SAN FRANCISCO.—This company will receive bids until June 6 for the construction of a 24-stall frame round-house at Yale, Tenn.

SAN BENITO & RIO GRANDE VALLEY, SAN ANTONIO & ARANSAS PASS.—The Interstate Commerce Commission has issued certificates authorizing the San Benito & Rio Grande Valley, a subsidiary of the New Orleans, Texas & Mexico, to build two branch lines in the lower Rio Grande valley of southern Texas, one extending eastward from Fernando about six miles and the other extending eastward from San Benito about 18 miles. In the same decision it authorized the San Antonio & Aransas Pass, a subsidiary of the Southern Pacific system, to build an extension from Harlingen to Brownsville, about 30 miles. As the two lines are somewhat parallel the two cases were heard together and the Missouri Pacific opposed the Southern Pacific application. The commission finds that public convenience and necessity require the construction of the lines proposed by both companies notwithstanding some overlapping of service in a portion of the territory.

UNION PACIFIC.—This road has been authorized to construct an extension of the southeasterly spur of its Lyman branch in an easterly direction, a distance of 1 mile, in Scotts Bluff County, Neb. The estimated cost of construction, including 0.27 mile of siding, is \$35,470.

VIRGINIAN.—This road has let a contract to W. W. Boxley & Co., of Roanoke, Va., for a concrete lining of about 1,071 ft. at the east end of Polk Gap tunnel in West Virginia at a cost of approximately \$75,000.

BUFFALO, ROCHESTER & PITTSBURGH.—Bonds.—This company has applied to the Interstate Commerce Commission for authority to sell \$3,536,000 of consolidated mortgage 4½ per cent bonds, now in its treasury, to the most favorable bidder. The proceeds are to reimburse the treasury for expenditures from income.

CENTRAL OF NEW JERSEY.—1926 Earnings.—Annual report for 1926 shows net income, after interest and other charges, of \$4,368,760, as compared with \$3,596,118 in 1925. Selected items from the income statement follow:

Central of New Jersey	
	1926
Average mileage operated	690.89
RAILWAY OPERATING REVENUES	690.90
Maintenance of way	\$6,777,562
Maintenance of equipment	14,408,216
Transportation	22,382,369
TOTAL OPERATING EXPENSES	\$45,993,621
Operating ratio	76.44
NET REVENUE FROM OPERATIONS	\$14,177,497
Railway tax accruals	4,780,862
Railway operating income	Not shown
Equipment rents—Dr.	\$821,128
Joint facility rents—Dr.	446,162
NET RAILWAY OPERATING INCOME	\$8,051,535
Non-operating income	1,674,372
GROSS INCOME	\$10,391,152
Rent for leased roads	2,343,873
Interest on funded debt	3,072,608
TOTAL DEDUCTIONS FROM GROSS INCOME	\$6,022,392
NET INCOME	\$4,368,760

CHICAGO & NORTHWESTERN.—Equipment Trust.—This company has applied to the Interstate Commerce Commission for authority for an issue of \$1,950,000 of 4½ per cent equipment trust certificates, to be sold at not less than par.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—Bonds.—The Interstate Commerce Commission has authorized an issue of \$1,000,000 of first and general mortgage 5 per cent gold bonds, \$650,000 of the bonds to be sold at not less than 100½ and interest, for short-term notes.

CHICAGO, MILWAUKEE & ST. PAUL.—Hearing of Minority Interests.—The Jameson Committee of bondholders, representing \$17,000,000 of junior bonds, made what was believed to be its final attack on the reorganization of this road as recently approved by Judge James H. Wilkerson. The hearing, May 20, was on an appeal from Judge Wilkerson's order, which denied a petition of the Jameson Committee opposing the reorganization plan. After a day's argument the court took the case under advisement.

CHICAGO & EASTERN ILLINOIS.—1926 Earnings.—Annual report for 1926 shows net income, after interest and other

charges, of \$644,355, as compared with \$161,968 in 1925. Selected items from the income statement follow:

Chicago & Eastern Illinois	
	1926
Average mileage operated	945.13
RAILWAY OPERATING REVENUES	945.13
Maintenance of way	\$3,044,951
Maintenance of equipment	7,241,196
Transportation	10,349,070
TOTAL OPERATING EXPENSES	\$22,605,951
Operating ratio	80.02
NET REVENUE FROM OPERATIONS	\$5,645,800
Railway tax accruals	1,642,000
Railway operating income	\$3,993,866
Equipment rents—Net Dr.	834,080
Joint facility rents—Net Dr.	551,244
NET RAILWAY OPERATING INCOME	\$2,608,542
Non-operating income	422,243
GROSS INCOME	\$3,030,785
Rent for leased roads	154,750
Interest on funded debt	2,177,113
TOTAL DEDUCTIONS FROM GROSS INCOME	\$2,386,430
NET INCOME	\$644,355
Appropriations of income for sinking fund	\$177,500
Interest on bonds in sinking fund	47,950
Balance transferred to profit and loss	\$418,905 Def. \$53,285

CHICAGO, ROCK ISLAND & PACIFIC.—Equipment Trust.—This company has applied to the Interstate Commerce Commission for authority for an issue of \$8,815,000 of 4½ per cent equipment trust certificates, to be used in connection with the acquisition of cars, locomotives and cranes, to the amount of \$11,406,745. The company proposes to solicit bids from various bankers and dealers in equipment trust obligations and to submit the best bid or bids to the commission when received. The application gives the estimated costs of the various types of equipment as follows:

Ten mikado locomotives at \$68,209; 5 mountain locomotives at \$68,422; 5 baggage cars at \$20,517; 5 dining cars at \$51,080; 10 coaches at \$28,684; 40 suburban coaches at \$20,050; 4 baggage and passenger cars at \$25,374; 4 baggage and mail cars at \$23,597; 10 baggage cars at \$19,276; 25 mikado locomotives at \$76,597; 10 mountain locomotives at \$472,680; 1,000 box cars at \$2,162; 500 auto cars at \$2,558; 500 coal cars at \$2,244; 250 ballast cars at \$2,268; 250 flat cars at \$1,709; 5 gas-electric motor cars at \$42,670; 4 Jordan ballast spreaders at \$10,500; 1 locomotive crane at \$14,800 and 1 at \$13,300, and 1 wrecking crane at \$47,000.

DELAWARE & HUDSON.—Proposed Lease of B. & P.—In its brief, in support of its application to the Interstate Commerce Commission

(Continued on page 1648)

Annual Report

The Denver and Rio Grande Western Railroad Company

DENVER, Colorado, March 31, 1927.

To the Stockholders:

The Third Annual Report of your Company for the year ended December 31, 1926, is presented herein.

A summary of results of operation for the year compared with the year 1925, is as follows:

Operating Revenues.....	\$34,030,308.90
(Increase, \$400,845.41 or 1.19%)	
Operating Expenses.....	\$24,614,313.97
(Decrease, \$179,934.55 or .73%)	
Net Operating Revenue.....	\$9,415,994.93
(Increase, \$580,779.96 or 6.57%)	
Railway Tax Accruals.....	\$2,430,000.00
(Increase, \$113,908.08 or 4.92%)	
Uncollectible Railway Revenues.....	\$4,172.13
(Decrease, \$3,212.85 or 43.51%)	
Hire of Equipment, Net Credit.....	\$335,223.95
(Increase, \$363,012.48, there being net debit of \$27,788.53 for 1925)	
Joint Facility Rents, Net Credit.....	\$292,754.69
(Increase, \$17,919.64 or 6.52%)	
Net Railway Operating Income.....	\$7,609,801.44
(Increase, \$851,016.85 or 12.59%)	
Available for Interest.....	\$7,705,660.19
(Increase, \$925,373.17 or 13.65%)	
Interest and Sinking Fund.....	\$4,359,465.83
(Increase, \$142,156.25 or 3.37%)	
Surplus.....	\$3,346,203.36
(Increase, \$783,216.92 or 30.56%)	

Statistics

A summary of traffic statistics shows the following:

Freight revenue.....	\$26,907,817.97
(Increase, \$845,163.15 or 3.24%)	
Revenue net ton miles.....	1,944,114,202
(Increase, 89,259,088 or 4.81%)	
Revenue net tons.....	10,824,497
(Decrease, 179,187 or 1.63%)	
Revenue per ton mile.....	\$.01384
(Decrease, \$.00021 or 1.49%)	
Revenue per ton.....	\$2.486
(Increase, \$.117 or 4.94%)	
Average haul.....	179.60
(Increase, 11.03 or 6.54%)	
Passenger revenue.....	\$4,494,547.16
(Decrease, \$384,681.86 or 7.88%)	
Passenger miles.....	163,286,668
(Decrease, 16,790,239 or 9.32%)	
Passengers.....	717,964
(Decrease, 110,038 or 13.29%)	
Revenue per passenger mile.....	\$.02753
(Increase, \$.00043 or 1.59%)	
Revenue per passenger.....	\$6.260
(Increase, \$.367 or 6.23%)	
Average journey.....	227.43
(Increase, 9.95 or 4.58%)	

The principal operating costs and statistics were:

Maintenance of Way and Structures Expense.....	\$5,699,265.21
(Increase, \$157,068.38 or 2.74%)	
Miles of track relayed with new or second-hand rail.....	178.25
(Decrease, 5.49 or 2.99%)	
Cross tie renewals.....	970,571
(Decrease, 244,345 or 20.11%)	
Maintenance of Equipment Expense.....	\$6,242,157.96
(Increase, \$293,855.13 or 4.94%)	
Cost of locomotive repairs per hundred locomotive miles.....	\$25.65
(Increase, \$1.09 or 4.43%)	
Cost of freight car repairs per hundred freight car miles.....	\$1.10
(Decrease, \$.16 or 12.70%)	
Transportation Expense.....	\$10,304,180.17
(Decrease, \$531,490.07 or 4.91%)	
Cost of wages and fuel per 1000 gross ton miles—freight.....	\$.714
(Decrease, \$.087 or 10.86%)	
Cost of wages and fuel per train mile—passenger.....	\$.449
(Decrease, \$.006 or 1.32%)	
Cost of wages and fuel per freight car handled in yards.....	\$.506
(Decrease, \$.027 or 5.07%)	
Enginehouse expense per engine handled.....	\$4.94
(Decrease, \$.39 or 7.32%)	

Additions and Betterments

Excluding expenditures on leased lines, the cost of improvements charged to Capital Account was \$8,387,872.99. Charges to Operating Expenses, in connection with these improvements, amounted to \$1,185,448.26. Property retired and not replaced amounted to \$638,493.15, leaving a net increase in Capital account of \$7,749,379.84. The corresponding figure for 1925 was \$2,017,900.15, and the annual average for the period July 1, 1914, to date was \$2,454,882.50.

The principal improvements were:

Ballasting.....	\$453,165.86
161 miles of standard gauge main line, and 45	

miles of narrow gauge line, ballasted to standard with slag and gravel.	
Rails and other track material.....	\$337,533.43
100 miles of new 90-lb. rail laid in the main line, and 80 miles of branch lines relaid with the rail released.	
Bridges, trestles and culverts.....	\$285,556.02
Permanent improvement to carry heavier power made available by new power purchased.	
Additional trackage.....	\$477,007.62
11 miles of industry tracks, and 20.83 miles of service tracks laid during the year, including substantial extensions to yards at Pueblo, Minturn, and Walsenburg, Colorado.	
Change of grade and alignment.....	\$483,437.02
To facilitate train movement and reduce operating hazard, two line changes are being made between Buena Vista and Waco, and between Gypsum and Glenwood, Colorado.	
Equipment (new).....	\$2,372,472.30
Includes: 10 mountain type three-cylinder locomotives; 200, 50 ft., 100,000 lbs. capacity, automobile cars; 500, 110,000 lbs. capacity, steel gondola cars.	
Standardization of equipment.....	\$2,455,035.55
This includes the rebuilding and improvement of 117 locomotives and 5,625 freight cars.	
Kenilworth branch.....	\$368,348.55
To serve the mine of the Independent Coal & Coke Co. at Kenilworth, Utah. Opened for operation November 22, 1926. Length, 6.15 miles.	
Property retired.....	\$638,493.15
Included 464 freight cars, 34 locomotives, 50 passenger cars, 103 units of work equipment, and various trackage.	
Improvements on leased line.....	\$386,749.41
Not included in above totals. Represents improvements on the Rio Grande Junction Railway.	

Changes in Capital Stock

Preferred stock outstanding was increased \$449,200.00, by exchange from that held for conversion, leaving \$232,000.00 yet to be converted.

Changes in Funded Debt

Equipment Trust Series "A" Certificates, were decreased \$300,000.00 by payments from Operating Income during the current year.

Equipment Trust Certificates, Series "B", were issued for \$1,725,000.00 to apply on the purchase of 10 locomotives, 200 automobile cars, and 500 gondola cars.

Equipment Notes held by the Baldwin Locomotive Company were reduced \$60,000.00.

Valuation

During the year informal conferences were held with the Engineering and Land Sections of the Bureau of Valuation, resulting in additional allowances. Likewise a conference with the Accounting Section of the Bureau resulted in substantial concessions in the restatement of the investment account and in the report of original cost of the property to date.

The Tentative Valuation served February 19, 1927, states a value as of June 30, 1919, "for rate making purposes" of the property owned and used, of \$96,000,000.00; allows \$96,465,948.00 as the value of property owned; and \$98,520,359.00 as the value of property used.

We shall in due course and form protest the valuation.

Motor Bus and Truck Operations

Your company has purchased 50 per cent of the stock of the Denver Colorado Springs Pueblo Motor Way, Inc., operating between Denver and Pueblo, Colorado, 120 miles, since April 25, 1926; and two-thirds of the stock of the Western Slope Motor Way, Inc., operating between Grand Junction, Delta, Paonia, and Montrose, Colorado, since June 1, 1926.

Respectfully submitted,

By order of the Board of Directors,
J. S. PYEATT,
President.

[ADVERTISEMENT]

Railway Finance

(Continued from page 1646)

Commission for authority to lease the Buffalo, Rochester & Pittsburgh and to operate over the Pennsylvania from Buttonwood to Dubois, Pa., this company says that while claim is made that by lapse of time the contractual obligation of the B. R. & P. has expired, "no claim is made in the letters placed in evidence that the Buffalo, Rochester & Pittsburgh Railway Company will not make the lease if approval is given by the commission," and that "if that approval is given, no obstacle exists to the immediate making of the lease and to obtaining the public benefits resulting."

GREAT NORTHERN.—Extension of Deposit Date.—A second extension of time within which stockholders of the Great Northern and the Northern Pacific may deposit their holdings in assent to the plan for unification of these two roads, has been made from May 16 to June 15. While a substantial majority of the stock of each of the companies has been deposited, sufficient stock was not deposited to indicate complete agreement to the plan.

ILLINOIS CENTRAL.—Bonds.—This company and the Chicago, St. Louis & New Orleans have been authorized by the Interstate Commerce Commission to issue \$17,350,000 of joint first refunding mortgage 4½ per cent bonds, to be sold at not less than 95 and interest.

KANSAS CITY SOUTHERN.—Unification of Southwestern Roads.—The initial step in rearrangement of the plan to unify the Kansas City Southern, the Missouri-Kansas-Texas and the St. Louis Southwestern, the original draft of which was rejected by the Interstate Commerce Commission, was taken May 23, when L. F. Loree conferred with S. W. Moore, general counsel for the Kansas City Southern, and representatives of Ladenburg, Thalmann & Co. and Kuhn, Loeb & Co., bankers for the road. Although no definite conclusion was reached, according to statements given out, a statement was issued which called attention to the fact that the commission, in its decision, stated that the union of the three carriers seemed to be not an unnatural association and that the commission did not find the formation of a Southwest-Gulf system objectionable in itself.

L. F. Loree, chairman of the board of the Kansas City Southern and the Missouri-Kansas-Texas, called on President Coolidge at the White House on May 25 and later held an informal conference with Commissioner B. H. Meyer of the Interstate Commerce Commission. He stated to newspaper men that consideration is being given to the preparation of a revised application to be filed with the Interstate Commerce Commission for a combination of control of the K. C. S., M.-K.-T., and Cotton Belt, in view of the indications in the commission's decision that it might look with more favor upon a plan by which control would be centered in the M.-K.-T., than it did upon the plan for control by the Kansas City Southern, and that consideration was also being given to the formation of a new company. He also said that the

plan might be filed within ten days or so.

LEHIGH & NEW ENGLAND.—1926 Earnings.—Annual report for 1926 shows net income, after interest and other charges, of \$1,364,044, as compared with \$683,647 in 1925. Selected items from the income statement follow:

Lehigh & New England		
	1926	1925
RAILWAY OPERATING REVENUES	\$5,662,328	\$5,295,382
Maintenance of way	\$593,650	\$739,249
Maintenance of equipment	1,153,708	1,318,201
Transportation	1,716,128	1,733,080
TOTAL OPERATING EXPENSES	\$3,698,825	\$4,071,152
Operating ratio.....	65.32	76.88
NET REVENUE FROM OPERATIONS	\$1,963,503	\$1,224,230
Railway tax accruals	294,804	169,597
Railway operating income	\$1,668,319	\$1,054,504
Hire of freight cars—		
Cr.	136,674	5,158
Joint facility rents—		
Dr.	105,260	121,623
NET RAILWAY OPERATING INCOME.....	Not shown	
Non-operating income	\$190,075	\$162,191
GROSS INCOME.....	\$1,858,394	\$1,216,695
Interest on funded debt	335,525	344,150
TOTAL DEDUCTIONS FROM GROSS INCOME.....	\$494,349	\$533,048
NET INCOME.....	\$1,364,044	\$683,647
Income applied to sinking funds and other reserve funds.....	\$8,920	\$8,944
Surplus for year carried to profit and loss....	\$1,355,125	\$674,703

MISSOURI-KANSAS-TEXAS.—See Kansas City Southern.

NEW YORK CENTRAL.—Modification of Condition in Chicago Junction Case Asked.—This company, the Chicago Junction and the Chicago, River & Indiana have asked the Interstate Commerce Commission to modify or eliminate a condition attached by the commission to its order in 1922 authorizing the acquisition by the New York Central of control of the other two companies. Condition 14 provided that the order should not be taken as tending to establish the fair value of the respective properties or as a finding that the rental to be paid by the C. R. & I., for the lease of the Chicago Junction was just and reasonable. In March, 1927, the petition says, the commission issued its tentative valuation report finding a final value for rate-making purposes of \$31,667,626 for the property used by the Chicago Junction as of 1919, and petitioners represent that this corroborates the proofs offered at the hearing and tend to show a present cost of reproduction of the properties, including the value of its leases, of considerably more than the \$33,000,000 represented in the plan by the capitalization at 6 per cent of the \$2,000,000 rental.

PERE MARQUETTE.—Increase in Common Stock.—At a meeting of Pere Marquette stockholders on May 19, it was voted to approve a proposed increase of \$9,000,000 in the outstanding common stock to provide for the declaration of a common stock dividend of 20 per cent. Authorized common was increased from 450,460 shares to 550,552 shares.

New Director.—E. M. Hebbard was elected a director.

1926 Earnings.—Annual report for 1926 shows net income, after interest and other charges, of \$7,702,004, as compared with \$6,440,382 in 1925. Selected items from the income statement follow:

Pere Marquette		
	1926	1925
RAILWAY OPERATING REVENUES	\$45,799,700	\$42,710,690
Maintenance of way	\$4,866,508	\$4,850,274
Maintenance of equipment	9,529,997	9,104,647
Transportation	15,457,783	14,928,248
TOTAL OPERATING EXPENSES	\$31,886,011	\$30,725,256
Operating ratio.....	69.62	71.94
NET REVENUE FROM OPERATIONS	\$13,913,689	\$11,985,434
Railway tax accruals	2,409,488	2,064,675
Railway operating income	Not shown	
Equipment rents—Dr.	\$923,186	\$459,834
Joint facility rents—Dr.	773,888	672,374
NET RAILWAY OPERATING INCOME.....	\$9,793,524	\$8,770,220
Non-operating income	474,527	288,642
GROSS INCOME.....	\$10,267,751	\$9,058,863
Interest on funded debt	2,197,960	2,197,960
NET INCOME.....	\$7,702,004	\$6,440,382

ST. LOUIS SOUTHWESTERN.—See Kansas City Southern.

ST. LOUIS SOUTHWESTERN.—1926 Earnings.—Annual report for 1926 shows net income, after interest and other charges, of \$2,405,540, as compared with \$2,379,292 in 1925. Selected items from the income statement follow:

St. Louis Southwestern		
	1926	1925
Average mileage operated	1,747.78	1,750.22
RAILWAY OPERATING REVENUES	\$25,692,826	\$26,132,262
Maintenance of way	\$4,864,847	\$4,626,890
Maintenance of equipment	4,660,630	5,504,331
Transportation	7,491,604	7,536,033
TOTAL OPERATING EXPENSES	\$19,353,457	\$19,925,859
Operating ratio.....	75.33	76.25
NET REVENUE FROM OPERATIONS	\$6,339,369	\$6,206,404
Railway tax accruals	1,289,631	1,171,512
Railway operating income	\$5,049,926	\$5,029,359
Hire of freight cars—		
Cr.	142,024	162,264
Joint facility rents—		
Dr.	309,739	368,550
NET RAILWAY OPERATING INCOME.....	\$4,891,778	\$4,817,854
Non-operating income	211,990	271,176
GROSS INCOME.....	\$5,103,768	\$5,089,030
Interest on funded debt	2,655,515	2,667,974
TOTAL DEDUCTIONS FROM GROSS INCOME.....	\$2,698,229	\$2,709,738
NET INCOME.....	\$2,405,540	\$2,379,292
Income applied to sinking funds.....	\$58,625	\$32,099
Income appropriated for investment in physical property.....	1,336	.....
Surplus for year carried to profit and loss	\$2,345,578	\$2,347,193

OREGON SHORT LINE.—Tentative Valuation.—The Interstate Commerce Commission in its tentative valuation report finds the final value for rate-making purposes of the property owned for carrier purposes as of 1916 to be \$100,380,775 and that of the used carrier property to be \$106,144,873. The outstanding capitalization was

\$222,168,173 and the book investment in road and equipment was \$113,094,103. The cost of reproduction new of the used property, exclusive of land, was placed at \$105,071,396, and the cost of reproduction, less depreciation, at \$88,219,198. The company also used 47,230 acres of carrier lands, assigned a present value of \$10,159,923. The company owned \$170,375,199 par value of securities of and other investments in other companies, recorded in its accounts at \$161,492,704 book value.

RUTLAND, TOLUCA & NORTHERN.—*Incorporation.*—This company has been incorporated to acquire and operate a line between Rutland, Ill., and Granville, 27 miles, which has been abandoned by the Chicago & Alton. The line, which connects with the Alton at Custer, Ill., and with the Atchison, Topeka & Santa Fe at Toluca, Ill., is incorporated for \$100,000.

SOUTH OMAHA TERMINAL COMPANY.—*Stock.*—This company has applied to the Interstate Commerce Commission for authority to issue \$1,650,000 of common stock to the Union Stock Yards Company of Omaha, Limited, in payment for its railway property.

TENNESSEE & NORTH CAROLINA.—*Acquisition.*—The Interstate Commerce Commission has authorized this company to acquire control by lease of the properties of the Smoky Mountain, which has also been authorized to acquire the line formerly owned by the Knoxville, Sevierville & Eastern, from Vestal to Sevierville, Tenn., 27 miles. The commission also authorized the Smoky Mountain to issue \$75,000 of capital stock in payment.

UNION PACIFIC.—*Sale of Bonds.*—Kuhn, Loeb & Co. have purchased, subject to the approval of the Interstate Commerce Commission, \$26,835,000 of Union Pacific 40-year 4½ per cent gold bonds, due July 1, 1967, which they have offered for subscription, subject to allotment at 97½ and accrued interest, to yield 4.65 per cent to maturity. The proceeds of the sale of these bonds will be applied to the payment on July 1, 1927, of \$26,835,225 of Union Pacific convertible 4 per cent bonds which mature on that date.

VIRGINIAN.—*Sale of Stock.*—Adams & Peck have completed the placing with the public of 6,000 shares of Virginian common stock, which was the first public offering of the stock ever made. Nearly the entire \$60,000,000 of preferred and common stock has heretofore been held intact by the heirs of Henry H. Rogers, who built the road.

WABASH.—*Election of Directors.*—J. S. Crutchfield, of Pittsburgh, Pa., and A. E. Staley, of Decatur, Ill., were elected directors in place of J. C. Otteson, vice-president, secretary and treasurer of the company, and of S. Hoge, Jr., secretary to the chairman of the board. Other directors were re-elected.

WESTERN MARYLAND.—*1926 Earnings.*—Annual report for 1926 shows net income, after interest and other charges, of \$3,259,339, as compared with \$4,779,059 in 1925.

Selected items from the income statement follow:

Western Maryland		
	1926	1925
Average mileage operated	804.44	804.44
RAILWAY OPERATING REVENUES	\$25,259,575	\$19,861,774
Maintenance of way	\$2,952,965	\$2,493,541
Maintenance of equipment	6,098,196	4,566,342
Transportation	7,276,518	5,802,371
TOTAL OPERATING EXPENSES	\$17,404,633	\$13,965,557
Operating ratio	68.90	70.31
NET REVENUE FROM OPERATIONS	\$7,854,942	\$5,896,217
Railway tax accruals	1,096,082	775,205
Railway operating income	\$6,758,125	\$5,118,443
Equipment rents—Dr.	489,158	169,911
Joint facility rents—Dr.	193,743	222,374
NET RAILWAY OPERATING INCOME	\$6,075,223	\$4,726,158
Non-operating income	188,664	80,976
GROSS INCOME	\$6,263,887	\$4,807,134
Rent for leased roads	65,130	65,130
Interest on funded debt	2,599,985	2,604,659
TOTAL DEDUCTIONS FROM GROSS INCOME	\$3,004,548	\$3,028,075
NET INCOME	\$3,259,339	\$1,779,059

WESTERN NEW YORK & PENNSYLVANIA.—*Abandonment.*—This company and the Pennsylvania, lessee, have applied to the Interstate Commerce Commission for authority for the abandonment of a portion of the Wolf Creek branch, extending from a connection with the main line to Redmond, Pa., 7.7 miles.

Average Price of Stocks and Bonds

	May 24	Last week	Last year
Average price of 20 representative railway stocks	113.70	112.08	91.76
Average price of 20 representative railway bonds	94.80	94.70	91.64

Valuation Reports

The Interstate Commerce Commission has issued final or tentative valuation reports, finding the final value for rate-making purposes of the property owned and used for common-carrier purposes, as follows:

Final Reports

Augusta Northern	\$140,576	1916
Port St. Joe Dock & Terminal	65,500	1917
Pittsburgh, Lisbon & Western	661,450	1918
Leavenworth Terminal	374,000	1916

Tentative Reports

Oregon Short Line	98,350,000	1916
Missouri Pacific	237,050,000	1918

Dividends Declared

Bangor & Aroostook.—Common, 1½ per cent, quarterly; preferred, 1¾ per cent, quarterly; both payable July 1 to holders of record June 3.

Illinois Central Leased Lines.—Two per cent, payable July 1 to holders of record June 12.

Midland Valley.—Preferred, 2½ per cent, semi-annually, payable June 1 to holders of record May 24.

Mobile & Birmingham.—Preferred, 2 per cent, payable July 1 to holders of record June 1.

Pennsylvania.—1¾ per cent, quarterly, payable May 31 to holders of record May 2.

Pere Marquette.—20 per cent stock dividend, payable October 1 to holders of record September 7.

St. Louis Southwestern.—Preferred, \$1.25, quarterly, payable June 30 to holders of record June 11.

Officers

Financial, Legal and Accounting

Edward T. Miller, general solicitor of St. Louis-San Francisco, has been elected vice-president and general solicitor, with headquarters at St. Louis, Mo., a newly created position.

Operating

H. B. Shoemaker has been appointed assistant superintendent and supervisor of track of the Valley branch of the New York Central, with headquarters at Dunkirk, Ohio.

J. L. Webb, passenger agent of the Pennsylvania, with headquarters at New York City, has been appointed superintendent of stations and transfers, Central Region, with headquarters at Pittsburgh, Pa.

Engineering, Maintenance of Way and Signaling

Porter Allen, superintendent of the Eastern division of the Pennsylvania, Central Region, has been appointed chief engineer maintenance of way, Western Region, with headquarters at Chicago, Ill., to succeed W. L. Ekin, deceased.

F. W. Leeper, division engineer on the British Columbia district of the Canadian National, with headquarters at Prince Rupert, B. C., has been transferred to the Saskatchewan district, with headquarters at Saskatoon, Sask., succeeding C. Ewart, who has been transferred to Winnipeg, Man.

Traffic

George A. Poore has been appointed industrial development agent of the eastern lines of the New York, New Haven & Hartford.

Charles H. Haggerty, division passenger agent of the Pennsylvania, with headquarters at Louisville, Ky., has been appointed general agent, with headquarters in the same city.

A. J. Dexter, a county agent for South Dakota, has been appointed a representative of the agricultural department of the Northern Pacific, with headquarters at St. Paul, Minn., and will engage in agricultural development activities in North Dakota and Minnesota.

E. E. Nelson, assistant general passenger agent of the Northern Pacific, with headquarters at Seattle, Wash., has been promoted to assistant passenger traffic manager, with headquarters at St. Paul, Minn., effective June 1. **R. J.**

Tozer, general agent for the Orient, with headquarters at Shanghai, China, has been promoted to assistant general passenger agent, succeeding Mr. Nelson.

W. R. Sedin, chief clerk to the assistant freight traffic manager of the Great Northern, has been promoted to assistant general freight agent, with headquarters at St. Paul, Minn.

L. C. Jorgenson, assistant traffic manager of the Green Bay & Western, the Ahnapee & Western and the Kewaunee, Green Bay & Western, has been promoted to traffic manager, with headquarters at Green Bay, Wis.

Purchases and Stores

Heber O. Wolfe, who has been appointed general storekeeper of the Chicago & Alton, with headquarters at Bloomington, Ill., was born on May 18, 1900, at Corydon, Ind. After attending high school at Corydon, Mr. Wolfe en-



H. O. Wolfe

tered railway service at the age of 16 as a helper in the car department of the Alton at Bloomington. During the same year he was transferred to the stores department where he served in various capacities until September, 1919, when he was promoted to chief clerk to the storekeeper at the same point. In August, 1920, Mr. Wolfe was advanced

to general foreman, becoming traveling storekeeper in August of the following year. After nearly five years in this position, on February 1, 1926, he was promoted to assistant general storekeeper where he remained until his further promotion to general storekeeper on April 1.

Obituary

William H. Brill, general passenger agent of the Illinois Central, with headquarters at New Orleans, La., died in that city on May 20 after an illness of about three months.

William C. Wood, Jr., district freight and passenger agent for the Pennsylvania at Memphis, Tenn., died on May 17 at the Mayo Clinic, Rochester, Minn., following an illness of a month.

William S. Dawley, formerly chief engineer of the Chicago & Eastern Illinois and the Yunnan-Szechuan & Tengyneh Railway of China and since 1913 consulting engineer with offices at St. Louis, Mo., died aboard a train leaving the Tower Grove station in that city on May 18.

F. F. McCauley, superintendent of the Galena division of the Chicago & North Western, died on May 17 at his home in Chicago. Mr. McCauley was born on December 28, 1874, at Green Lake, Wis., and attended Ripon college, Ripon, Wis. After a short period of service as a trainman on a middle western railroad he became a freight brakeman on the Dakota division of the North Western on June 8, 1902. He was advanced to trainmaster at Huron, S. D., on December 1, 1910, becoming assistant superintendent at Winona, Minn., some four years later. Mr. McCauley was transferred to Ashland, Wis., in 1917 and was promoted to superintendent of the West Iowa division, with headquarters at Boone, Iowa, on September 10, 1918. On October 1, 1920, he was transferred to the East Iowa division, with headquarters at Belle Plaine, Iowa, and when the East Iowa and the West Iowa divisions were consolidated to form the Iowa division, on June 8, 1921, he was appointed superintendent. On June 1, 1924, Mr. Mc-

Cauley was transferred to the Galena division, with headquarters at Chicago, the position which he held until the time of his death.

Henry E. Huntington, formerly chairman of the board of the Chesapeake & Ohio and the Hocking Valley, died on May 23, at Lankenau hospital, Philadelphia, Pa., where he had undergone an operation recently. Mr. Huntington was born at Oneonta, N. Y., 77 years ago. Early in 1880 he superintended the construction of the Huntington lines then being constructed between New Orleans and Louisville, giving special attention to the construction of the Chesapeake, Ohio & Southwestern; he continued in that capacity until the roads were completed, which was about 1884, when he was appointed superintendent of the Kentucky Central, then being operated by the Chesapeake & Ohio. Early in 1885, he was appointed receiver of the Kentucky Central, and a year later, when the property was sold, he was appointed vice-president and general manager, holding these positions until the road was sold to the Louisville & Nashville about 1890, when he was chosen vice-president and general manager of the Elizabethtown, Lexington & Big Sandy and the Ohio Valley. He continued in charge of these roads until they were sold, when he went to California. During his connection with the Kentucky Central he was also superintendent of construction of the Maysville & Big Sandy. He had charge of the construction company which built the lines through Covington, Ky., and Cincinnati, O., including the Ohio river bridge. From April, 1892, to March, 1900, he served as first assistant to president of the Southern Pacific, representing the president at San Francisco. From March to June, 1900, he was second vice-president and from June, 1900, until June, 1904, first vice-president of the same company. He was also chairman of the board and a director of the Chesapeake & Ohio, the Chesapeake & Ohio Northern and the Hocking Valley, and a director of the Minneapolis & St. Louis and the Southern Pacific. Mr. Huntington retired from active railroad service in 1922.



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Railway Age



Motor Transport Section

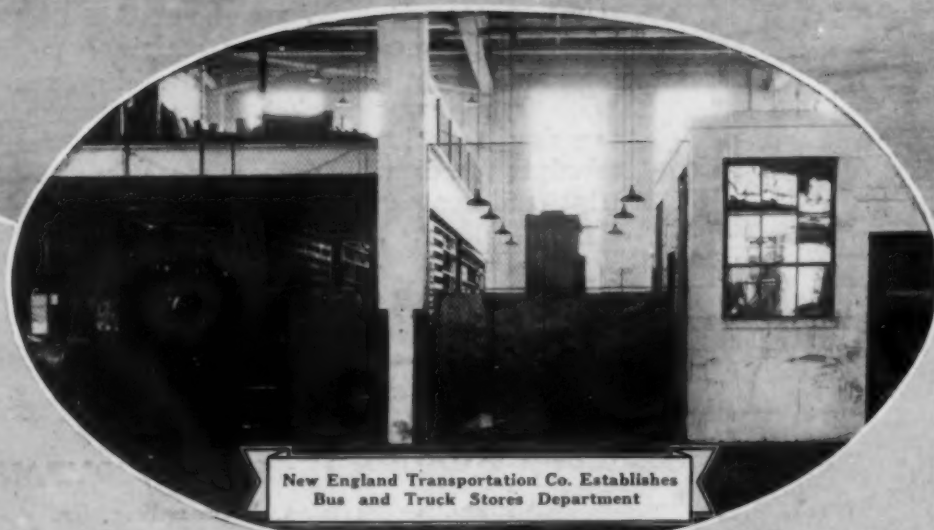
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FIRST HALF OF 1927—No. 26

NEW YORK—MAY 28, 1927—CHICAGO

SEVENTY-SECOND YEAR



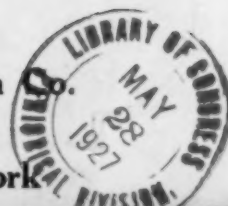
New England Transportation Co. Establishes
Bus and Truck Stores Department

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Stores Department of the New England Transportation

Jersey Central Inaugurates the "Jolly Tar Trail"

B. & O. Establishes Constructive Station at New York





Railroads again turn to Westinghouse

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Automotive Division, Wilmerding, Pa.

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Co-ordinated Transportation on the Boston & Maine

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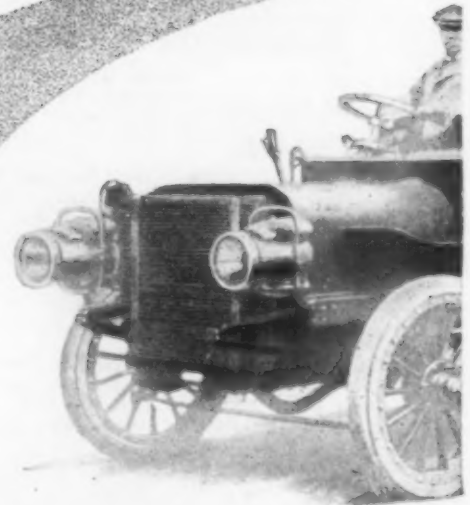
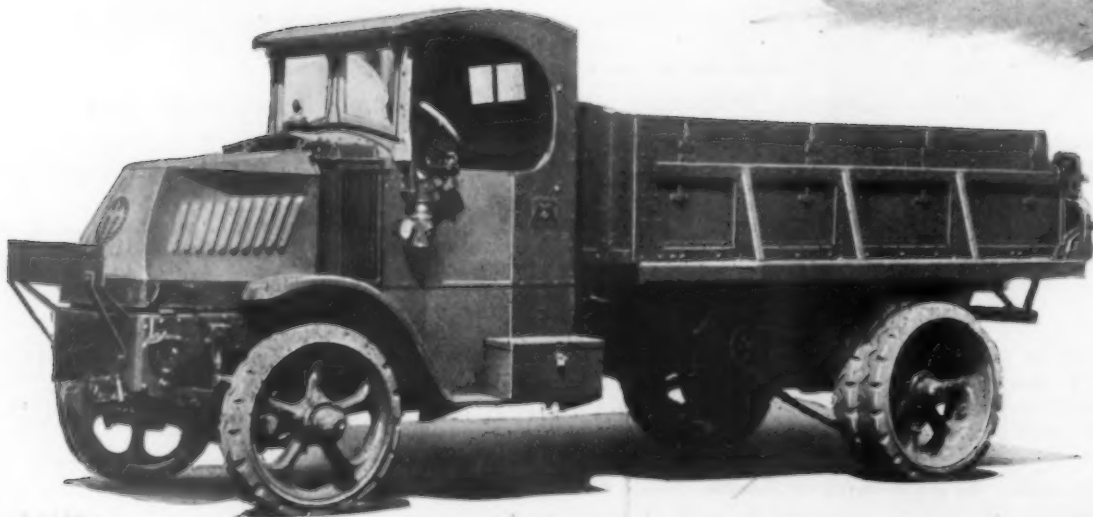
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Railway Age

Motor Transport Section

Devoted to the
Co-ordination of Railway and Highway Service

Vol. 82, No. 26

May 28, 1927

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Alton and S. P. Figure In Motor Transport News

TWO new developments of particular interest in the field of railway motor transport are noted in this issue. One is the application of the Southern Pacific Motor Transport Company for permits to operate four bus lines in central western California. The other is the application of the Alton Transportation Company for permits to operate a system of bus lines which will bring its highway mileage in Illinois up to 500. The proposals of the Southern Pacific are but the forerunners of many more similar ones which are expected fairly soon. Organized to operate both buses and trucks in co-ordination with service on the railway, the S. P. subsidiary plans for the present only passenger service on the highway. Its first undertakings, while small, comprise only 60 miles of bus routes, but are intensive enough in the small area affected to indicate that the Southern Pacific intends to go far in taking advantage of buses and trucks wherever their use will result in benefit to its patrons and itself. Similar intent is evident in the Alton applications. Since it has only 760 miles of railway lines in Illinois, a bus line system of 500 miles will give the Alton a highway operation of significant proportions. Both of these items in the news are evidence that the railways are awake to the opportunities for more efficient service inherent in their adoption of motor transportation.

"Fighting the Motor Bus" on the Decline

THERE is probably some significance in the fact that one sees fewer indications of railways "fighting the motor bus" now than a couple of years ago. Doubtless this is due in part to an increasingly better understanding among railway officers of the fact that in some cases the bus cannot be fought successfully and that in others their own interests indicate that it should not be fought. The tools of warfare which railways can use against the bus are limited and not always effective. Legislation which would give bus operators too free a rein can usually be opposed successfully, and the railways are finding it to their advantage to keep a wary eye on such developments. With an increasingly sympathetic attitude among state regulatory commissions, the railways are also able frequently to prevent bus competition by means of proof that their service is adequate from the standpoint of public necessity and convenience. After a bus line is started, railways can carry on the fight for traffic by improving the service of their passenger trains, and by calling the "all year round" merits of their service to the attention of their patrons, although this

is only occasionally successful for it cannot be denied that the motor bus can do some things better than railway trains can do them. "Fighting the motor bus" in such cases is likely to prove merely a waste of time and money. Where these conditions prevail it would seem more advantageous to admit the victory of the bus, either through withdrawal of opposition, or better through the establishment of railway bus service.

Constructive Station Expedites Freight Movement in New York

THE movement of freight to and from Manhattan Island, New York, has always been complicated for most of the railways entering that city because only one line, the New York Central, has direct all-rail freight service into the heart of Manhattan. All of the other trunk lines have had to depend upon rail-water terminals on the shores facing Manhattan, to and from which freight has been handled in car floats. This method has been expensive, both in time consumed in the handling of freight and in the actual cost of furnishing this service. To meet this situation the motor truck is being employed by most of the railways entering New York through rail-water terminals. The common practice has been to establish constructive freight stations at various piers on Manhattan Island and to handle freight through these stations by motor truck. By this scheme freight is loaded in a motor truck at the rail-water terminals opposite Manhattan Island, carried in the truck via ferry to Manhattan and in the same truck carried on to destination, either an inland freight station or the consignee's door. Outbound freight is handled in the same way, via motor truck from the shipper's door to the constructive freight station and via ferry to the rail-water terminal for loading into cars. Rates for the transportation of freight in this way cover its movement to the constructive station in the case of inbound freight and from the constructive station in the case of outbound freight, the shipper or consignee paying the drayage charge for transportation between his door and the constructive station. The Baltimore & Ohio has one of the largest, if not the largest, operation of this nature. Inaugurated about two months ago, the plan has already proved a distinct success. It has not only greatly expedited the service given to freight, but has effected marked reductions in the cost of handling it. The establishment of constructive freight stations and the handling of freight to and from Manhattan Island by motor truck by the Baltimore & Ohio and other railways is an important contribution to faster and more efficient freight transportation. It has demonstrated how effectively and successfully motor truck transportation can be co-ordinated with railway transportation.

Where the Bus Will Triumph

RECENT decisions of public utility commissions give evidence of considerable consistency in policy in dealing with applications by independent operators for bus permits in territory served by railroads. In one case a permit was granted to an operator over a route which follows several different lines of railroad for short distances without paralleling any one of them very far. This bus line will give service along "the rim of the wheel" instead of compelling passengers "to travel by one spoke to the hub and out another spoke to destination." Railway revenues may be somewhat reduced by this, but the new transportation service will be so superior that the operation is permitted.

In another case a permit was given to an operator over a 60-mile route paralleling two railway lines. The railroads objected, saying that the line was competitive and their service adequate, which is true. It developed, however, that the bus operator had already been running the line for some time and had enjoyed a good business—there being in the meantime no perceptible decline in railroad traffic. It was also brought out that this operator was selling reserved seats, most of which were taken in advance, and that he was running from a hotel terminal to another hotel terminal without intermediate stops. Plainly his service was something different from railroad service. In another case there was an application for a permit which would give a frequent bus service competitive with infrequent train schedules. This permit was likewise granted. At the same time, numerous requests for bus service to compete with direct and frequent train service were denied.

The official attitude generally resolves itself into this: Where train service is as frequent and as direct as proposed bus service, the train service can generally hold the field. On the other hand, even if the bus lines promise to cut into railroad revenues, they will be permitted to operate if they provide a substantially more direct and convenient service, distribution at terminals being considered.

What Depreciation Basis?

AS the depreciation charge is a very considerable part of the cost of operating a motor bus, it should be based upon a rate of depreciation which will write off the initial cost by the time the bus is ready for scrapping, but which will not constitute an unfairly heavy charge on its operating expenses. An article in this issue entitled "Opinions Differ on Depreciation Basis" gives the views of a number of railway officers in charge of motor bus operations as to the proper rate of the depreciation charge on motor buses.

That there is a marked difference of opinion among these officers—and hardly any of them agree—is due to several conditions. In the first place, the bus operations in their charge are of widely different natures. One line referred to has a large fleet of buses, the constant operation of which piles up large daily mileages for each of them. Another has only a few buses operating over one short route and making a small daily mileage. Another is largely a tour service. Since the nature of the operation of a motor bus exerts a marked effect upon the rate at which it should be depreciated, it is natural that differences in depreciation plans should exist.

Another reason for the difference of opinion is the lack of general agreement as to the extent that obsolescence, rather than the wearing out of a bus, limits its

length of service. Some feel that the design of buses has already attained a refinement which will prevent their becoming obsolete in the near future by the design of much better buses. Others contend that bus design has not yet reached this stage and that therefore obsolescence, along with wearing out, must be considered in determining a rate of depreciation. Another difference of opinion exists as to the length of life in term of miles of buses, and this difference can largely be accounted for by the differing physical characteristics of the routes.

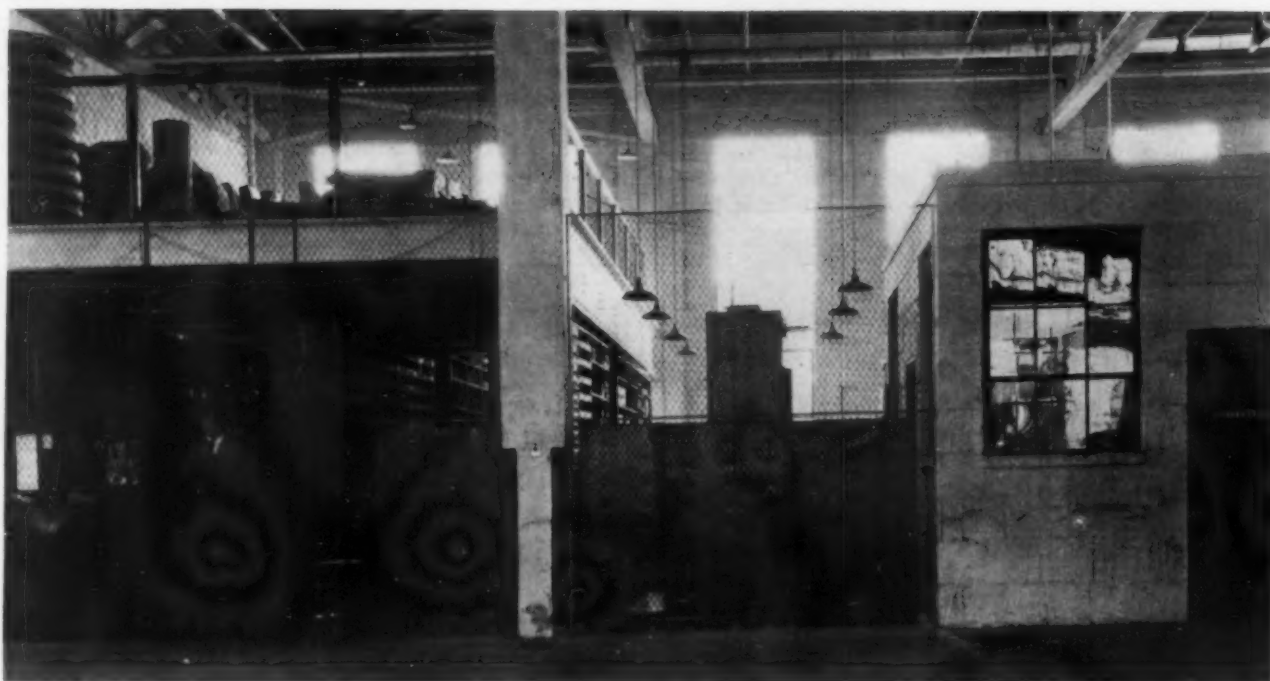
The conclusion seems justified that under average conditions the mileage basis of depreciation is preferable, this being predicated, of course, upon efficient maintenance throughout the life of the vehicle. In coming to a conclusion as to the basis that they should use for the depreciation of their buses, the railways will have to determine for themselves whether the conditions under which their buses operate are average.

Organizing a Stores Department

ELSEWHERE in this issue appears an article describing the stores department of the New England Transportation Company. This department has been modelled to a great extent after the stores organization found on many steam railroads. However, the organization has been suitably modified to meet the requirements peculiar to motor coach maintenance, and several interesting forms have been devised to meet conditions uncommon to a railroad stores department. A three part tag has been worked out which is used when a part is sent to an outside shop for repairs. This tag furnishes the stores department with a complete audit for this work, thus eliminating the possibility of being charged for work not actually performed. Another interesting form has been devised for obtaining an accurate record of the gasoline and oil purchased by the coach operators at fuel stations other than those operated by the company at its terminal points. Other forms of equal interest have been worked out which provide the storekeeper with a complete record of stores department transactions uncommon to steam railroad practice.

Since the stores department was organized practically from the ground up, unusual judgment had to be exercised in the stocking of materials. The company did not have years of experience of coach operation, such as steam railroads have. In the main, the supplies were selected on much the same fundamental basis as used by a railroad stores department. This basis was supplemented by a study of the frictional parts of the coaches that are more liable to cause failure or accident. The stock has been built upon this basis, but is subject to change as maintenance and operating experience show where improvements can be made.

The steam railway is able to keep its stock requirements down to a minimum owing to the standardization of its rolling equipment. Owing to the recent and rapid development of motor coach transportation, the question of standardization has not been given adequate consideration. Since the New England Transportation Company has its stores department organized on a sound basis, it is now directing its attention to this problem. The first step in this direction has been the adoption of a standard set of specifications which cover coach bodies and fixtures for semi-de luxe and de luxe coaches. Auxiliary equipment and mechanical parts are also being rapidly standardized. On the whole, this stores organization is efficient and it functions smoothly in its relations with the mechanical department.



General View of the Central Stores Department Located at Providence, R. I.

Stores Department of the New England Transportation Company

Stocking of parts and supplies based on frictional wear and obsolescence—Modern methods used in ordering and disbursing materials

THE New England Transportation Company was organized in 1925 as a motor coach subsidiary by the New York, New Haven & Hartford to act as a feeder and provide co-ordinated service with the New Haven's trains. Since the company has been organized, it has acquired 197 road units in revenue service which operate over 46 routes covering 1,200 miles of road in the states of Massachusetts, Connecticut and Rhode Island.

As a subsidiary of the railroad, all purchasing orders for the transportation company are made by the railroad's purchasing department and delivered or consigned to the stores department of the motor coach company. With the transportation company, responsibility for materials and supplies rests on the assistant manager, the stores department head reporting to him. The stores department forces are also concentrated at the general stores and not distributed over the various divisions.

The fundamental principles of automotive stores and those of the railroad are similar, yet the practical applications in many respects are at variance with the established rail customs and methods. Some idea of what a bus company's stores department must handle in the way of materials and supplies can be had from the following tabulation of the various types of automotive equipment which go to make up the 197 units operated by this company. These units are listed in the table.

The Equipment Owned by the New England Transportation Company

42 Mack coaches	11 Hudson touring cars
32 White coaches	1 Packard touring car
45 Yellow coaches	11 Chrysler service cars
37 Fageol coaches	2 Mack two-ton trucks
33 Pierce-Arrow coaches	1 Mack wrecker
7 International Harvester coaches	1 Reo one-ton speed wagon
12 Hudson sedans	

The first special equipment for the company was manufactured in 1925 and was made up of manufacturers' standards as follows:

12 Macks, 4 cylinder, Lang Type A. B. body, 25 passengers, baggage on roof
10 Whites, 4 cylinder, Bender Type 50-A body, 25 passengers, baggage rear compartment
10 Yellows, 6 cylinder, Yellow Coach Type Y body, 29 passengers, baggage on roof

In addition to these units there is a long list of special equipment which goes on the motor coaches and must also be handled by the stores department. A portion of this equipment is shown in one of the tables.

Some of the Specialties Carried by the Stores Department

Air brakes, Westinghouse	Gas tanks, 50-gallon
Kotex No. 41, imitation leather for inside roof and sides	Shock absorbers, Lovejoy rear end
Genuine leather—Alpha Grain—for seats	Air springs on front end, Cleveland Pneumatic Tool Company
Green battleship linoleum on floor	Batteries, Willard P. R. T. 8
Draw curtains, Leschner-Whitman No. E-112	Lubrication, Alemite
Karpen fibre pneumatic cushions	Radiator shutters, Campbell Pantasote
Wheels, Budd-Michelin, ten studied	Fare boxes, Johnson
Fire extinguishers, Pyrene	Bearings, Timken throughout
	Universal joints, Spicer

The general stores department is located at the major

The material which is used most frequently is placed on the shelves nearest the disbursing counter. Thus, the first bins contain engine parts, such as valves, pistons, piston rings, etc. The material which is the least in demand is the furthest from the counter. This allocation of the materials required a long study of the movement of parts over the counter, but the study has

This Form Provides the Storekeeper with a Complete Record of the Materials Ordered and When Received

Approximately \$35,000 worth of supplies is kept in the general stores department at Providence. The space allotted to this department is enclosed by a wire grided partition. As may be seen from the illustration, the office of the storekeeper, which is made of concrete blocks, is included in this enclosure.

As may be seen from the illustration, a complete line of gaskets is kept on the wood partition next to the machine shop. These gaskets are hung on brass hooks and arranged to utilize the minimum space on the partition. Under each gasket is a brass frame in which is placed a card containing the material or part reference number for the gasket.

Only a small supply of new springs are carried in the stores department as active stocks owing to the limited

Form 45 Is Used for Keeping a Record of the Material Received and Disbursed

space in the stock room. This accounts for the small number of springs under the gasket board shown in the illustration.

On the balcony, which extends over part of the store-room, are kept bulky supplies, such as transmission cases, upper crank cases, tires, fenders, etc. Neither motors, transmissions nor differentials are kept in stock assembled. Sufficient parts are available, however, to assemble a transmission or a differential.

Method of Purchasing Materials

To obtain materials, the storekeeper prepares requisitions and sends them to the manager's office for approval, who in turn sends them to the purchasing agent of the railroad for ordering of the material. Material is requisitioned on Form 5, which is in triplicate. The orange and white sheets are sent to Boston. The approved orange sheet is then forwarded to the vice-presi-



The Supplies Are Neatly Piled in Metal Shelving

dent in charge of purchases at New Haven. The white sheet is retained in the manager's office. The third or yellow sheet is retained in the storekeeper's office at Providence. This sheet, which is illustrated, contains columns for ordering and receiving the material and is kept in a binder until each column is filled in and each item checked off.

Some of the N. E. T. coaches are serviced and stored at independent garages. Form 23, in quadruplicate, on which are listed labor, storage and material, has been prepared for outside maintenance service. This form is filled out at the garage making the repairs and all material and supply charges are supported with signed material and supply slips which are attached to Form 23 and sent to the mechanical superintendent and storekeeper at Providence for their joint approval. The original and two copies are forwarded to the manager who approves the charges and then forwards the original and

one copy to the purchasing agent for final approval for payment. The first sheet of this form is shown in one of the illustrations.

Receiving Ordered Materials

All material received at the main storehouse is unpacked and checked by the night stores attendant. The usual form of invoice of material furnished is attached to the package. The form is designated as Form 6.



This Section Is Set Aside for the Service Parts

The checker lists each item of material received on a receiving record called Form 44, which is given to the recording clerk who enters the items on Form 45, the function of which will be explained later.

How Material Is Disbursed

Materials are disbursed, whether at the general stores or sub-store, on receipt of an order form similar to the standard material order form used by the railroads, which is called Form 22. The material is charged to the indi-



The Form 45's Are Kept in the Cabinet Filing Desks Located in the Storekeeper's Office

vidual coach, or in the instance of supplies, to the proper account as provided for in the auditor's classification.

The sub-stores requisition material on the main store using duplicate Form 25 which is shown in one of the illustrations. The original is sent to the storekeeper who ships the material, together with shipping Form 27. This form is stamped "Sign and return to storekeeper if listed material is received."

When material is ordered on the general stores which it does not have on hand, the stores department requi-

in one of the illustrations, are 10 in. by 8 in. They are filed in card record desks, shown in the interior view of the storekeeper's office. The cards are filed alphabetically and numerically according to part names and numbers. The cards are also grouped according to repair parts, such as electrical parts, carburetors, etc., and sub-divided under coaches of various makes.

Until a few months ago, tally sheets were used in connection with receipts and posted in binders. The binder

[illegible]

**This Form Is Used by the Main and Sub-Stores for Shipping
and Receiving Materials**

sheets were so arranged as to permit a consolidation of commodity and stock book. This record sheet provided for the requisition number, date, quantity requisitioned, quantity received, price, transfers and disbursements by weeks of any given part or supply. It was found that the binders were cumbersome, occupied con-

Form 25-NET

ORIGINAL

NEW ENGLAND TRANSPORTATION COMPANY

REQUISITION FOR MATERIAL

192

Business Dept. _____

Please forward to _____

at _____ for use _____

Coach No. _____ Agent No. _____

Amount On Hand	Amount Used For Mts.	Amount Wanted	DESCRIPTION	Ordered On P. A.

Originator _____ Approved _____

Forwarded date _____ Tag _____

By _____ By _____

Form Used by a Sub-Stores for Requisitioning Material on
the Main Stores

siderable storage space and required more time than necessary to post the items and make the weekly checks as to material on hand.

This system has been replaced with the card filing system. These cards, designated as Form 45 and shown

Form 15-5677

ADJUSTMENT TAG # **1052**

Date _____

Removal From Coach _____

Cause of Removal _____

Odometer Reading _____

Foreman _____

FORM INI R.E.L.

New England Transportation Co.

Name _____ Date _____

Address _____

Repair the following _____

Cost _____

AUTHORIZED BY _____

REMOVED FROM _____ 1735

DO NOT REMOVE THIS TAG

Indicate this number on your invoice as well as nature of repairs and attach this stub.

REPAIRED FOR THE 1735

NEW ENGLAND TRANSPORTATION CO.

REPAIRS AUTHORIZED BY _____

REMOVED FROM _____

REPAIRER TO ATTACH TO INVOICE

Date _____ 1735

To _____

The following was directed _____

To repair _____

Removed from _____ Signed _____

Form 40-5-57		2 853	
<u>SERVICE PART REMOVAL TAG</u>			
Catch #	Date		
Service part removed	give name		
and type or model			
Reason for Removal			
Required by			
		Foreman	
		2 853	
At time of removal of service part from stock this section of tag to storekeeper at time of withdrawal from stock of new service part.			
Catch #			
Service part removed			
		Foreman	

The Adjustment Tag, Repair Part Tag and the Service Part Removal Tag Used by the N. E. T. Stores Department

solescence expense. In the event that disbursements from a sub-store deplete the stock on a given item and the foreman fails to requisition an additional supply, the disbursement slips, when posted semi-weekly, indicate that item to be below the minimum and material is forwarded automatically from the general store. If a sub-stock point requisitions more of any item than would seem to be required by the amount disbursed on the material slips, indicating that material has been used and not properly accounted for, this condition is checked immediately while the matter is current. Physical checks of all stocks are also made quarterly.

used to replace similar worn parts. After the bus is again placed in service, some of these new parts fail and have to be replaced long before they have given adequate service. When such a part is removed, it is tagged with a card designated as Form 43, which is shown in

one of the illustrations. Its identity is thus retained. The storekeeper prepares a report based on the findings of the mechanical department together with his records as to the company from which the part was purchased. The report is sent to the assistant to the manager of the N. E. T. Company, who collaborates with the purchasing agent in dealing with the manufacturer of the defective part for adjustment. In most cases an adjustment is allowed. This system has been the means of saving the company much money in the form of adjustment allowances on new parts replacing those which failed in service.

Service Parts

It is desirable to have a means of charging to the proper coaches the cost of repairing parts removed and replaced with others from stores stock, such as radiators, generators, batteries, magnetos, starting motors and carburetors. When, for example, a magneto is removed from a coach, a two-part tag, called Form 42, is attached to it. This tag is shown in one of the illustrations. A new or repaired magneto is immediately installed in the coach. The magneto removed is sent to the repair shop, with the upper portion of Form 42 attached to it. The lower portion of the tag is retained by the storekeeper. By means of these tags the storekeeper can check against the parts repaired and returned and ascertain what parts are still out for repairs. After the repaired part is returned to stock, the tag is removed and the material and labor charges for repairing it are then charged against the coach from which the part had been removed. The repaired magneto is then ready for replacement on any coach that may require one. This tag also serves as a basis for properly accounting for depreciation, in connection with service parts.

S. P. Proposes Four Bus Lines

THE Southern Pacific Motor Transport Company, a Southern Pacific subsidiary, the organization of which was reported in the *Railway Age* of April 30, made application to the California Railroad Commission on May 11 to operate motor bus passenger service between Santa Cruz, Cal., and Watsonville Junction, a distance of 20 miles; between Santa Cruz and Davenport, 12 miles; between Asilomar and Del Monte Junction, 19 miles; and between Del Monte Junction and Salinas, 8 miles. The Southern Pacific at the same time made application to withdraw certain passenger trains now operated between these points, the buses to take the place of these trains.

The officials of the Southern Pacific Motor Transport Company are given in the application as: E. J. Foulds, president; T. B. Wilson, vice-president and manager; G. L. King, secretary. The following statement is made in the application of Southern Pacific Motor Transport Company:

"The purpose of the applicant's proposed operation is to replace branch line steam trains of the Southern Pacific Company, now operated at a loss within the districts aforesaid, with a less expensive but more adequate service by motor bus. The proposed service of the applicant will furnish the patrons of the Southern Pacific with local passenger service connecting with main line trains of the Southern Pacific, more convenient than the present branch line steam passenger service and more convenient than could be rendered by rail because of the greater cost of said operation.

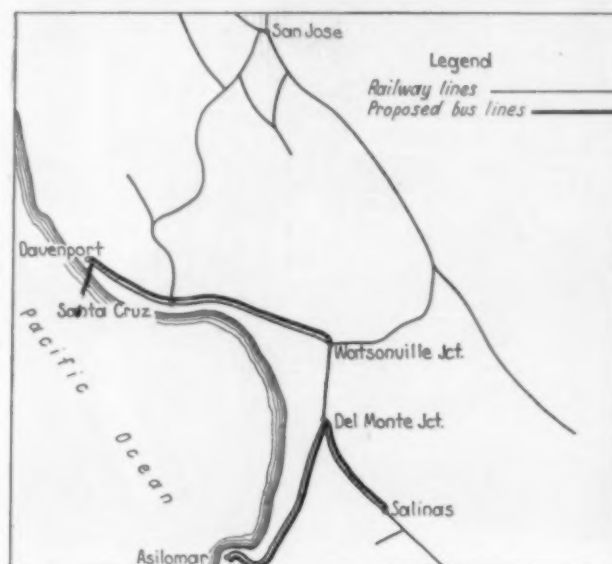
"The proposed operation will be a direct substitution for and supplemental to certain passenger train service

of the Southern Pacific, not in competition with said train service but co-ordinated therewith. There is no present motor vehicle service by highway between the Southern Pacific stations above referred to, or making direct connections with Southern Pacific trains."

The proposed fares to be charged on the stages are filed with the application and are the same as those that now apply on trains serving those towns.

In an exhibit accompanying the application it was stated that the motor bus equipment to be used will have a seating capacity of 25 or more and will be of the latest design of a standard make, and modern and commodious. The equipment will be owned by the Southern Pacific Motor Transport Company and sufficient vehicles will be provided to meet the needs adequately with buses as "stand by" equipment to meet emergencies.

According to the proposed schedules filed with the commission, the Southern Pacific will continue to operate steam trains between Santa Cruz and Watsonville



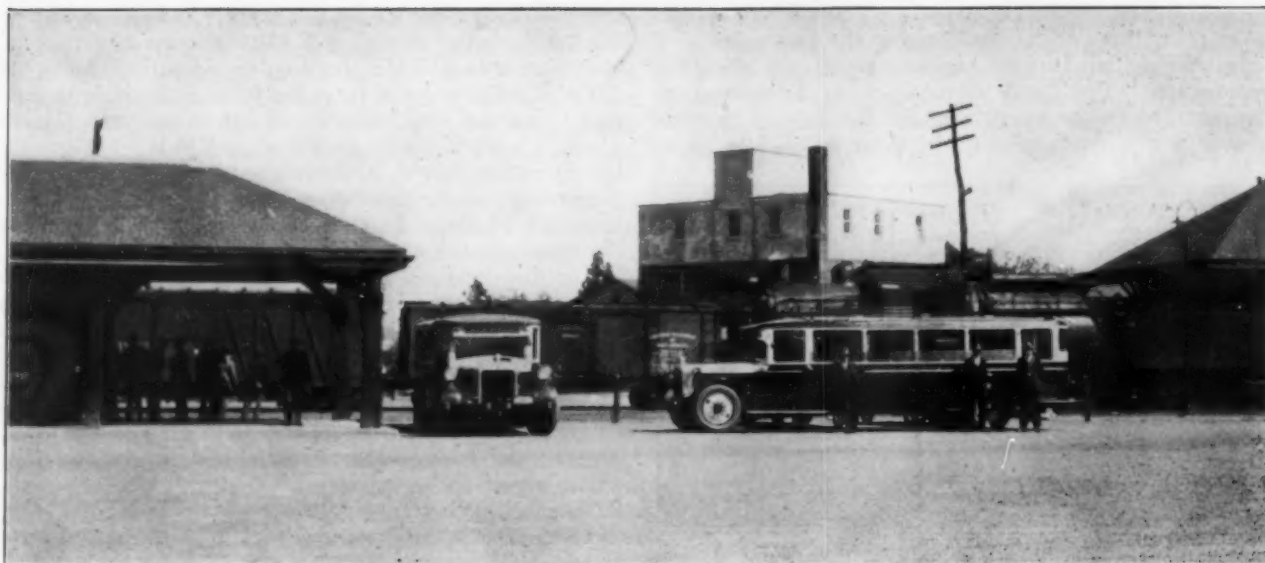
Sixty Miles of Bus Lines Proposed by Southern Pacific

Junction, providing two round trips per day. The Southern Pacific Motor Transport Company will provide bus service in place of other local trains. Additional bus connections will be made with train 69, a night local from Los Angeles and points south of Watsonville Junction, but leaving Watsonville Junction at 7.55 a. m. An additional bus trip is also provided from Santa Cruz leaving there at 10 p. m., arriving at Watsonville Junction at 11.10 p. m. and connecting with the "Padre" for Los Angeles and other points south.

Between Del Monte Junction and Salinas, buses will make connection with trains from and to San Francisco and Pacific Grove.

Between Del Monte Junction and Pacific Grove, the Southern Pacific will continue to run two steam trains each way. The Southern Pacific Motor Transport Company will substitute buses in lieu of other local trains now operating, and in addition a bus trip will be made from Pacific Grove at 8.05 p. m. arriving at Del Monte Junction at 9.10 p. m., connecting with the Sunset Limited for Los Angeles and other points south.

Commenting on the applications filed with the commission, F. S. McGinnis, passenger traffic manager of the Southern Pacific, stated that due provision will be made in the co-ordinated bus and train service to take care of any heavy traffic which may develop.



"Jolly Tar" Buses at Lakewood, with a Connecting Train Just Entering Station

Jersey Central Inaugurates the "Jolly Tar Trail"

Buses replace six branch line trains at an estimated saving of \$16,000 yearly

ON May 22 the Central of New Jersey, through its subsidiary, the Jersey Central Transportation Company, began the operation of motor buses on the Lakewood (N. J.)-Barnegat route. The new operation is known as the "Jolly Tar Trail" and the bus service is provided in substitution for trains taken out of service.

Barnegat is reached by railroad by a branch line which joins the main line at Lakehurst, 7.9 miles south

of three daily round-trips from Lakehurst to Barnegat, connections being made at the former point with main line trains running between New York and Atlantic City.



The Piedmont Inn Is a Bus Stop—The Line Serves Many Such

of Lakewood. Heretofore the ordinary daily train service on the branch has consisted of one through express train between Barnegat and New York in both directions, which ran over both the branch and the main line. Other train service on the line consisted



The Bus and a Train at Barnegat Station

The bus service replaces the three exclusively branch line round-trips terminating at Lakehurst. The round-trip of the express train between Barnegat and New York will be retained. It will be noted that the terminus of the bus operation is Lakewood instead of Lakehurst, the former being much the larger community of the two and quite as convenient a point for making train connections as the latter. There is, also, with the bus service some saving in mileage for northbound passengers, since

the railroad trip from Lakewood to Toms River, as can be seen on the map, is made along the two sides of a right triangle, whereas the highway route runs along the hypotenuse. The total distance from Lakewood to Barnegat, by bus, is approximately 25 miles. The route is over a new concrete state highway practically all of



Barnegat Is a Center for Fishing, Boating and Bathing During the Summer Season

the distance, which highway is excellently constructed, without any bad curves or grades.

Expect to Effect Large Savings

In presenting its application to the New Jersey Board of Public Utility Commissioners for authority to sub-



The Operators Were Chosen Locally and Thoroughly Trained

stitute bus service in lieu of train service, the railroad estimated that on the three round-trips on the Barnegat branch it would save approximately \$16,000 a year by bus substitution. Revenue from operation of the four

trains in each direction on the branch in 1926, including head-end traffic, totaled \$27,158, whereas the cost of operation was \$55,575, leaving an operating deficit of \$28,417. The revenue from the three exclusively branch line trains for which the buses are substituted totaled \$14,935, and the cost of operation \$36,175. Figuring bus operating cost at 30 cents a mile, it is estimated that the savings on the three round trips will bring an operating net of about \$850, assuming that the buses carry the same number of passengers as the trains.

For this service the Jersey Central has purchased two American Car & Foundry series L parlor coaches each seating 27 passengers. The lower body of the coaches is painted a dark green. The belt line is black, striped in gold, bearing the lettering "Jolly Tar Trail" in red and gold. The words "Jersey Central Transportation Company" in smaller letters appear in gold on the lower part of the body. The window trim is cream. The chairs are of wicker equipped with double deck cushions. There are no chairs over the rear wheel housings. One of these coaches is operated for the three round trips



The Jersey Central's Bus Route—Cross-Hatched Line Is Rail Route Between Lakewood and Barnegat

over the entire route each day. The other accompanies it as far south as Beachwood in each direction to take care of possible overflow traffic. The buses make the regular station stops on the Barnegat branch—not all of them, however, at the railroad's own station. In addition five other stops have been designated, making a total of 16 on the 25-mile route. No other stops are to be made, as the company desires to give a service comparable to that of the railroad from the standpoint of speed, which would be impossible were stops made at every cross-road.

Rates and Ticketing

Careful study was made of the tariff requirements and tariffs were drawn up showing through rates to points on the Barnegat branch, stating definitely the division between the rail and bus haul. Tickets are valid on either the railroad or the bus line.

In order to have some sort of ticket which the driver could collect instead of honoring without taking up, coupon forms were made up to replace the usual form

of commutation, 50-ride and scholar's tickets. Only hand baggage is carried on the buses, since it is possible for heavier luggage to be carried on the remaining trains. Passengers may pay cash fares, without excess charge, if they so desire, for which purpose the ordinary duplex cash fare receipt is used. Passes are not honored on the coaches.

The territory served, as the map shows, is near the sea and it is developed as a resort territory. Housing development tends to stay close to the highway over which the Jersey Central buses are operating.

Supervised by Railroad Officers

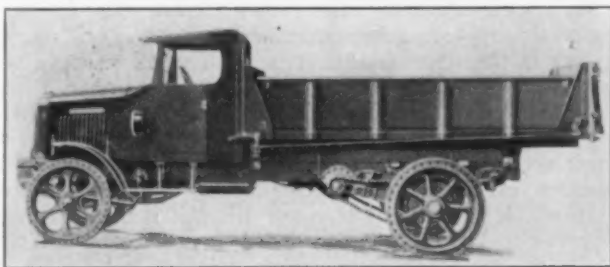
The operation is entirely under the supervision of railroad officers. The man in actual charge of the operation is the railroad's general agent at Lakewood and to him the bus operator's report. He in turn handles the business of the line under direction of the operating and traffic departments. The operators were secured locally and were thoroughly schooled in their duties before the beginning of the operation. A comprehensive schedule of rules for the guidance of these operators has been drawn up covering all phases of their duties.

The buses are garaged at a public garage in Lakewood, which is under contract to service them and supply gasoline and oil.

International Harvester Offers New Chain Drive Trucks

TWO new four-cylinder chain drive dump trucks, with capacities of $2\frac{1}{2}$ tons and $3\frac{1}{2}$ tons, have been developed by the International Harvester Company, Chicago. The appeal of the chain drive truck lies in the simplicity of the chain mechanism, the ease with which adjustments and repairs can be made, and the ability of such trucks to pull out of gravel pits and excavations.

Both the new International Harvester models are provided with a wide range of gear ratios so that when necessary a maximum of power can be exerted and at



One of the New International Harvester Trucks

other times a fair rate of speed with minimum fuel consumption can be obtained. The transmission includes four speeds forward and one reverse, and in the larger model, in addition to the reduction gear type of drive, the live axle has a two-speed range providing a wide choice of power application. A simple arrangement for adjusting the tension of the chain is incorporated in the steel radius arm which transmits the torque from the rear wheels to the frame.

Other features of the new trucks are removable cylinders; worm and wheel steering gear with the post carrying wheel at a 30-deg. angle and the connecting

shaft vertical, thus providing maximum foot clearance and convenience for the driver; auxiliary rear springs; a frame consisting of deep double steel channels, one inside the other, each section being $\frac{1}{4}$ -in. thick; and a liberal number of cross members that give the entire chassis great rigidity.

Graham Brothers Adds 16 Passenger Parlor Coach

GRAHAM BROTHERS, Detroit, Mich., which has been manufacturing a 12-passenger parlor type motor coach for some time, has added model 546 which is a 16-passenger parlor bus. This model differs from model 545, the 12-passenger vehicle, in seat construction and arrangement only. Four double seats extend along the left side of the body and four single seats on the right side, while a section of four individual seats extends across the full width of the coach at the rear end. One of these rear seats is readily removed to provide passage through the emergency door located at the left rear side.

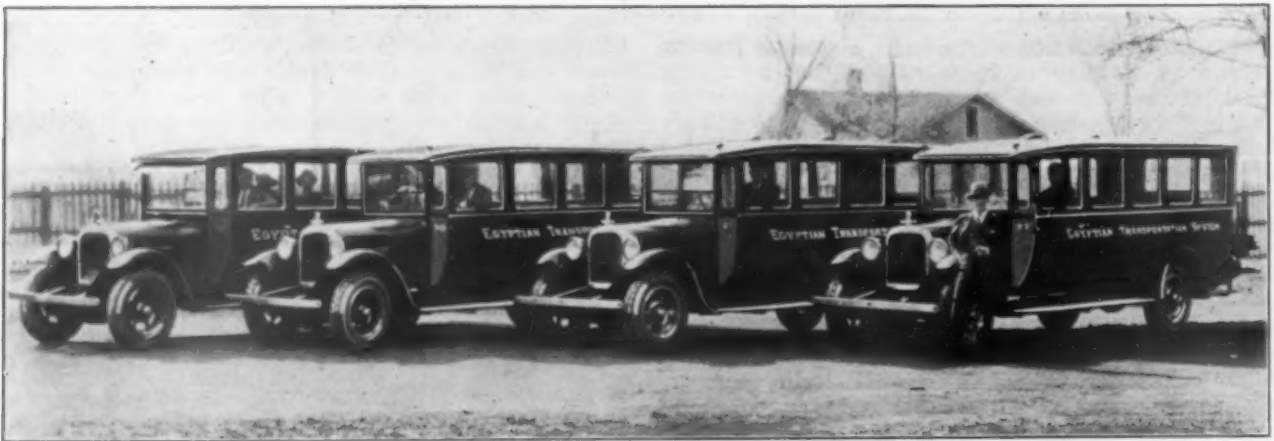
The seats, which are of the chair type, are constructed of steel tubing framework, with hardwood seat bases, the whole covered with wicker woven from fibre which



The New Graham 16-Passenger Parlor Coach

will not crack, splinter or break. The air filled spring cushions are upholstered in genuine Spanish grain leather, with a coil spring unit as a sub-base. The seat backs are equipped with detachable covers of the same leather. The seats are anchored to the floor by means of hinged sockets which are attached to both front legs of each seat. They cannot be tipped backward but may be easily swung forward to facilitate the cleaning of the coach interior. Ample aisle space and leg room are provided. The coaches are equipped with a wide entrance door, large plate glass windows of the frameless type, a heater, roof ventilators, electric fan, a nickel plated baggage carrier on the roof and ample lighting facilities. The chassis is the same as that used in model 545 being chassis JC, which has a 162-in. wheel base. The power plant is four-cylinder Dodge Brothers engine of the L-head type which develops 35 brake horsepower.

RAILWAY passenger traffic in Scotland is being steadily lost to the buses, says Consul Borney at Edinburgh. The railways are attempting to induce tax payers to protest against the damage done to roadways by the heavy buses, pointing out that road taxes have more than trebled in 10 years in Scotland. The railways, as large rate payers, they point out, are obliged to pay this trebled tax to maintain motor ways for their rivals.



Buses Regularly Run Several Hundred Thousand Miles

Opinions Differ on Depreciation Basis

Five out of nine railway bus companies favor mileage principle, and four, time principle

WHETHER depreciation charges on buses, one of the largest items of operating cost, should be figured on a basis of years of service or on a basis of miles operated is a question upon which there is a wide diversity of opinion among officers in charge of railway bus operations. This has been brought out by the replies of nine such officers to several questions relative to depreciation of buses.

Of these nine officers, five favor the mileage basis for figuring depreciation charges while four prefer the time basis. Of the four favoring the time basis, one prefers this on account of the limited number of miles that his buses operate daily, while another points to the fact that motor equipment is still in the development stage so that obsolescence rather than deterioration is the principal factor to be considered.

The point of obsolescence is not held to be of so great importance among the officers whose companies depreciate their buses on a mileage basis. They favor the mileage basis because in general buses will wear out after so many miles of operation and until that time they can be depended upon to render service. No two of the five officers favoring this method, however, agree as to the number of miles which constitute the life of a bus. One of them considers the mileage life of the bus to be as low as 200,000 miles, while another places it at 400,000 miles. There seems to be no disagreement to the view that in the case of buses operating less than 200 miles per day the time basis of depreciation should be adopted.

Questions Submitted

The following questions were submitted to the officers whose replies are the basis of this article:

1. Do you figure depreciation on a mileage basis? If so, how many miles do you consider constitute the life of a bus? Why do you favor this method?

2. Do you figure depreciation on a time basis? If so, how many years do you consider constitute the life of a bus? Why do you prefer this method?

3. If buses regularly operate less than 100 miles a day what method of figuring depreciation do you think

is best? If buses make between 100 and 200 miles a day? If buses make over 200 miles a day?

Why Time Basis Is Favored

R. H. Clarkson, manager of the Santa Fe Transportation Company, a Fred Harvey subsidiary which operates motor buses in tour service for the Atchison, Topeka & Santa Fe in New Mexico, favors depreciation of buses on the basis of their life in term of years.

"We do not figure depreciation on the mileage basis," says Mr. Clarkson. "All of our equipment is depreciated on a basis of 25 per cent per annum for light cars such as we use for extended motor land cruises. All of these cars at the present time are Packard eights and sixes. Our motor coach equipment of all types is depreciated on a basis of 20 per cent per annum.

"We prefer the time basis rather than mileage for the reason that motor equipment, taken all over, is still more or less in the development stage, and what we have to protect ourselves against is obsolescence rather than deterioration. I am confident that the cars and coaches we have in operation today will be fit to carry on their work six or eight years from now; but with the rapid advance in chassis and body design, providing more comfortable and speedy transportation, it is obvious that in order to keep the standard of our service on a high plane, we must expect to replace our coaches and cars before they are worn out."

The time basis of depreciation is also used by the Oregon-Washington Railroad & Navigation Company, according to J. P. O'Brien, general manager. Only one motor bus is operated, the route extending from Walla Walla, Wash., to Pendleton, Ore., making approximately 200 miles per day. The Oregon-Washington Company depreciates this bus at the rate of 20 per cent a year, figuring on a life of five years for the bus.

N. C. & St. L. Depreciates Buses 20 Per Cent Yearly

The Nashville, Chattanooga & St. Louis favors an arbitrary charge of 20 per cent per annum on each of the buses that it operates. It does not use the mileage

basis on account of the daily mileage of its buses being small.

Discussing the question, F. W. Kelsey, superintendent of the Chattanooga division, who is in charge of the N. C. & St. L. Motor Transit Company operations, says: "On account of the limited mileage that is made by the five units we have, the cars averaging less than 100 miles a day, we decided not to attempt to use a mileage basis for calculating depreciation but concluded to take an arbitrary 20 per cent per annum on each car. This amount is charged in on each month's statement against the operation. Emergency equipment has to be provided for our small fleet which would answer well for a fleet many times its size, hence we are getting a very small mileage per month per car.

"My study of the depreciation feature has resulted in the opinion that the class of equipment, the miles per day made by each unit and the speed at which it must be operated all influence a conclusion as to the proper means of calculating depreciation. In these days of intense competition and the desire of the public for quick time, it is to be supposed that any line of motor transportation will strive to make the best possible schedule, and further, that a company of average proportions will keep its cars on the maximum daily mileage basis, under which conditions the mileage basis for depreciation will be more appropriate.

33⅓ Per Cent Charge Recommended

"Buses operating less than 100 miles a day should make a charge of at least 33⅓ per cent per annum for depreciation. The same will apply if they are operated from 100 to 200 miles; over 200 miles depreciation should be figured on a mileage basis of 200,000 miles per unit, this on the assumption that only first-class equipment of standard makes is used.

"I think our depreciation charges are too liberal and that we should have started in to write the cars off in three years. The reason I arbitrarily take a three-year period is that after the cars have been operated this length of time, the upkeep on them costs almost as much as charges for depreciation of the first three years, since it stands to reason that the upkeep cost will increase as the car is used. Furthermore, as every year improvements in make and style are being made, after three years the equipment is obsolete, and ordinarily there is no second-hand value of any consequence in such equipment." The fourth railway which uses the time basis, uses a depreciation charge of 10 per cent per annum, figuring on a 10-year life.

Why Mileage Basis Is Preferred

The Northland Transportation Company, one of the largest railway bus companies, figures depreciation on a mileage basis and considers 300,000 miles constitutes the life of a bus. It favors writing off depreciation on a mileage basis for the reason that during the slack operating months its operating costs are not charged with a fixed rate of depreciation, while during the months of heavy traffic when the buses are constantly in service a greater depreciation is written off, and its operating costs reflect the actual depreciation of the bus.

While not favoring the time basis of depreciation the Northland considers five years to constitute the life of a bus. Its depreciation charge per mile is three cents. The Northland believes, however, that it might be a good method to depreciate buses operating on runs of 100 miles or less per day on a time basis, rather than a mileage basis as one would hardly be able to depreciate a bus out of existence in five years at the rate of 100 miles per day.

400,000 Miles Considered Bus Life

The Canadian Pacific Transport Company, which operates three buses over a six-mile route in the vicinity of Galt, Ont., figures depreciation on a mileage basis, assuming 400,000 miles constitutes the life of a bus. This method was adopted because the life of the bus generally is dependent on the service rendered, which of course, in the case of buses, represents mileage operated.

The SamOset Company, the bus-operating subsidiary of the Maine Central, figures depreciation on the mileage basis, as follows: Buses, eight cents per mile; tires, one-half cent per mile. It favors this method because its buses are not operated throughout the year. With respect to the time basis of depreciation, the SamOset Company feels that the adoption of this method would depend on the character of service and the all-year round plan of operation.

Mileage Basis Favored by Denver & Interurban

The mileage basis of depreciation is favored by the Denver & Interurban Transportation Company, which is controlled by the Colorado & Southern through its subsidiary, the Denver & Interurban Railroad, according to W. H. Edmunds, general manager, whose views are expressed as follows:

"On the large 30-passenger equipment, which is the only type we are using at present, we believe it proper to depreciate on a mileage basis of 200,000 miles per car, equated on the entire value of the car minus tire equipment.

This method is preferred by reason of the fact that depreciation is carried along equitably with the service performed by the equipment, and also for the reason that if the equipment is used in service giving proper mileage, obsolescence would not seem to be a determining factor. Where smaller, lighter equipment is used, it



Santa Fe "Indian Detour" Buses Are Depreciated on a Time Basis

would probably be wise to depreciate this on a smaller life expectation.

"Where proper mileage can be had, I do not favor the time basis. If time is considered the determining factor, however, I think five years should be considered the life of the bus in order to care for obsolescence.

"If buses operate less than 100 miles per day, the time basis should apply. If proper mileage can be made under the five-year period, however, I think the mileage depreciation is preferable. This would apply to buses making more than 200 miles a day."

New England Has Had Several Depreciation Bases

The New England Transportation Company is about to change from a time basis of depreciation to a mileage

basis. The various methods of depreciation that it has used and the reasons for its changes are given in the following statement by A. P. Russell, president.

"In connection with highway operation it is rather difficult to determine precisely the proper basis for depreciation, having in mind fairness to operation on the one hand, and the accrual of a fund sufficient to take care of retirements on the other. The basis of depreciation depends to a great extent upon the character of the service.

"We commenced operating on the highways about September 1, 1925, having at first a few disconnected short lines taking the place of rail service. The operation developed so that we now operate 47 lines with a total of about 1,200 route miles and a total coach mileage per year of substantially 6,500,000. During this process of growth we have adopted several methods of depreciation.

"At first we contemplated depreciating 90 per cent of the value of the unit over a four-year period, but prior to our initial operation, decided, in order to be on the safe side, to charge off annually one-third of the value of each piece of equipment. As this was evidently too high it was soon decided to charge \$7 per day for each unit of equipment making a mileage of less than 117 miles and at 6 cents a mile on all equipment operating more than 117 miles per day.

Obsolescence Recommended as

Fundamental Principle

"It was then recommended by a prominent engineering and operating company that the basis of obsolescence rather than mechanical life should be the fundamental principle governing a depreciation policy. It was suggested that a five-year period should be taken as a reasonable assumption under present conditions, although realizing that the rapid changes in the art, the whims of the public and the sales efforts of enterprising manufac-



The New England Is Changing to a Mileage Depreciation Basis

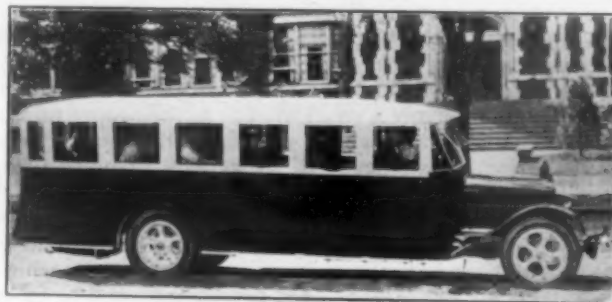
turers to force new models upon the market, might modify this assumed period. At the same time it was pointed out that the mechanical life of properly maintained vehicles might be expected to outlast the five-year period but that the severity of the service requirements and the mileage rendered were variables affecting the life of the equipment.

"At this time it was suggested that a differential rather than a straight line scale of annual charges should be made in order that the sum of accruing depreciation plus current mechanical maintenance might be a more uniform charge over the adopted period of years, and it was recommended that the charge for the first year be 25 per cent, the second and third years 20 per cent each, for

the fourth and fifth years, 15 per cent each, leaving at the end of the five-year period a salvage value of 5 per cent.

It was decided, however, that as an experiment, our plan of depreciation would be changed so that the depreciation on the equipment as a whole would be spread over a five-year period and charged against the lines operated, on the estimated basis of miles operated during the year. This resulted in a charge of 5.77 cents per mile operated, creating a fund greater than necessary to take care of all retirements, and thus becoming an unfair charge to operation.

"Based on the experience of others, including several



Obsolescence, as Contrasted with Deterioration, Is a Factor

of our own subsidiaries, we have now reached the conclusion that with equipment thoroughly maintained the principal question in determining a fair charge of depreciation is that of serviceable life rather than obsolescence, and while obsolescence might have been a factor up to the time of the standardization of our equipment, it has now ceased to be so to any great extent.

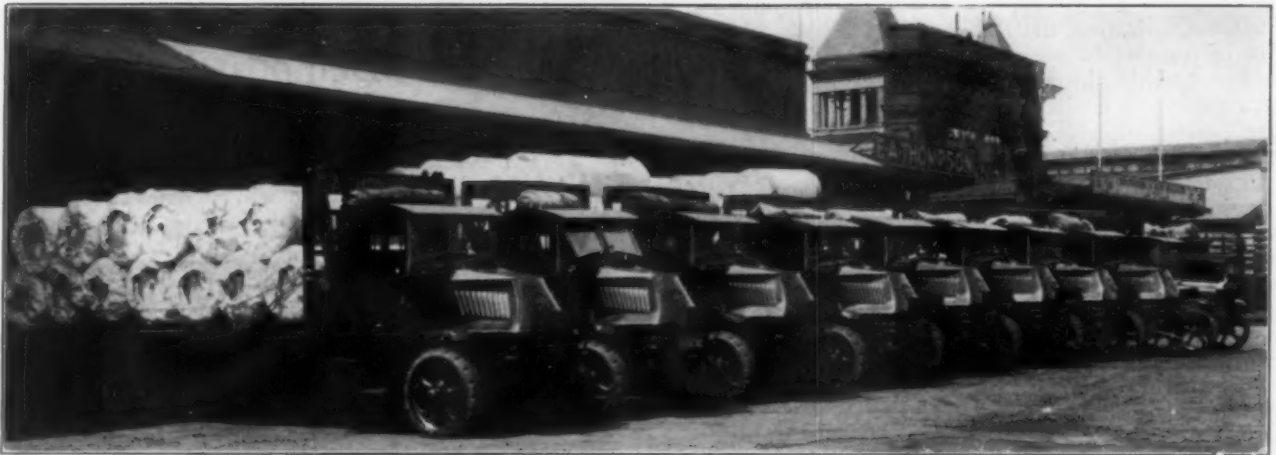
About to Change to Mileage Basis

"We are, therefore, about to change from a basis of time to a basis of miles, confident that deterioration accumulates because of service rather than because of a change in the style and character of equipment, and we have come to the conclusion that spreading a unit over 225,000 miles, or four general overhaul periods, will be fair to operating costs and at the same time produce a fund sufficient to replace the equipment as retired.

"On the basis of the average cost of \$10,000 per unit, this produces a figure of about 4.5 cents a mile, which will hereafter be adopted until we see reason to make another change. We are confident not only that this is a conservative charge, but that if and when another change is made, it will be to increase the miles of service life and diminish the cost per coach mile.

"An operation diversified in character, with a certain amount of equipment which remains out of service because of either the seasonal or week-end peak loads, requires a charge which will meet the varying conditions, and we now believe that a mileage basis is superior to a time basis in distributing this charge over a specific operation.

"On one of our lines depreciation was first charged on the basis of 200,000 serviceable miles and this resulted in a charge of five cents a mile operated. As coaches remained in service after 200,000 miles, this was later increased to 250,000 serviceable miles, bringing the operating charge per mile down to four cents, and on this particular line there are now several units which have been operated nearly 300,000 miles, with some difficulty of determining under the system of maintenance and overhaul when the end of the service life of the units will have been reached."



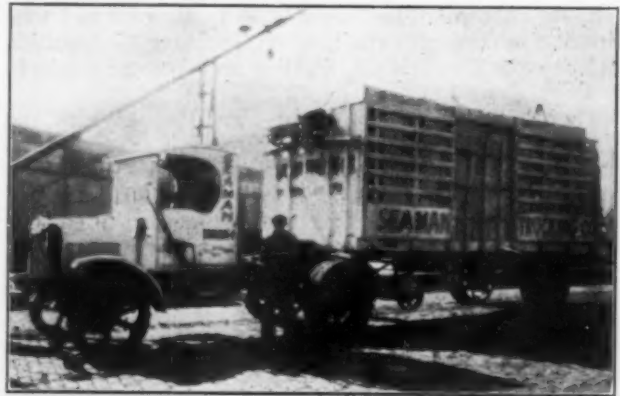
Trucks of E. A. Thompson, Inc., Lined up at a B. & O. Pier

B. & O. Establishes Constructive Station at New York

Service accelerated and overloaded station facilities relieved by truck operation

TO relieve congestion at its freight station on Manhattan Island as well as to reduce rehandling and expedite its service, the Baltimore & Ohio on March 1 established a constructive freight station for carload freight at South Ferry, New York. Under this arrangement freight is handled by motor truck between St. George Terminal, Staten Island, and consignees' or shippers' warehouses through the South Ferry constructive station, which is located at the Manhattan terminus of the Staten Island ferry.

The trucking is done for the Baltimore & Ohio by five trucking companies, which are under contract and bond to the railroad company, and the responsibility for the safe carriage of the freight rests with the Baltimore & Ohio through its contract truckmen between South Ferry station and St. George, Staten Island. The trucking between the South Ferry constructive station and the consignees' or shippers' places of business is entirely for



The Seaman Trucking Company Has 20 Tractors and Trailers Operating Through the Constructive Station



One of the 70 Trucks Used by the B. & O. in New York

the account of the consignees or shippers, as the case may be, and the trucking charges for this part of the service are in accordance with whatever arrangement has been previously entered into between the contract truckmen and the consignees or shippers.

Inbound freight is routed via the Baltimore & Ohio to South Ferry Station, New York, in care of one of the contract trucking companies, and outbound freight is delivered by the shipper to whichever contract truckman he prefers for shipment through South Ferry station—this latter station being designated on bills of lading as point of origin.

All kinds of freight in carloads, except waste paper and certain articles which are customarily restricted from free lighterage or handling through pier stations in New York harbor, may be handled through the constructive station.

The freight rates in effect to and from New York via

the Baltimore & Ohio apply to and from this South Ferry constructive station, the Baltimore & Ohio absorbing the cost of transfer between Staten Island and South Ferry as a part of the through transportation movement. This arrangement is similar in many respects to the constructive stations of certain other New York trunk lines, but differs from some in one important respect. Some other trunk lines have designated one truckman to handle the freight through the constructive station, but the Baltimore & Ohio has elected to complete contracts with several truckmen believing it advantageous thus to secure several reputable trucking companies who are specialists in handling different kinds of merchandise. The shipping public is therefore able to select one of several truckmen.

Prior to the establishment of the South Ferry station certain Manhattan stations of the Baltimore & Ohio were at times taxed beyond their normal capacity and the constructive station has proved its worth by reducing congestion at these other stations, at the same time permitting the railroad to improve its service and increase its business.

Five Trucking Companies Employed

The truck operations of the Baltimore & Ohio through its constructive freight station are handled under contract by five trucking companies located in Greater New York. These companies are E. A. Thompson, Inc., New York; the Keahon Trucking Corporation, New York; the Bell Trucking Company, Brooklyn; Held Brothers, New York, and the Seaman Trucking Company, Brooklyn. These companies operate a fleet of more than 125 trucks, which are at all times available for South Ferry Station service.

E. A. Thompson, Inc., uses Mack trucks of 5 to 7 tons capacity, exclusively; the Keahon Trucking Corporation includes 5 to 7 tons Mack, Sterling and Autocar trucks in its fleet.

The Bell Trucking Company has large White and Mack trucks, while the Seaman Trucking Company has tractor and trailer equipment, in addition to its regular heavy-duty motor trucks.

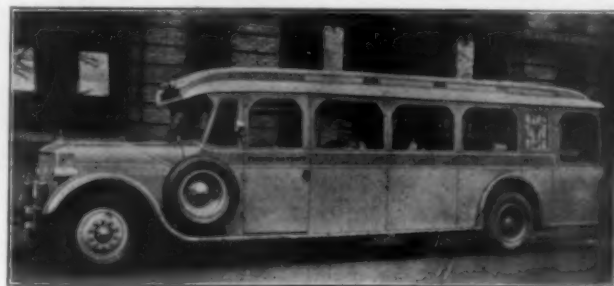
The contract truckmen have shown a keen interest in the development of this new service, with the result that inbound cars are unloaded almost immediately upon arrival, and merchandise has passed through the South Ferry constructive station and is on its way to ultimate delivery within a very short time after freight cars have been placed for unloading to motor trucks in the Baltimore & Ohio's Staten Island terminal.



A Mack on the N. E. T.

Timken-Detroit Starts Demonstration Bus

A DEMONSTRATION motor bus named the "Timken-Detroit" has been started by the Timken-Detroit Axle Company, Detroit, Mich., on a tour, the itinerary of which will include virtually all parts of the United States. The purpose of the tour is



The Demonstration Coach Is Now Touring the Country

to demonstrate Timken axles and the most efficient ways of caring for those in service. The bus is complete in itself, containing leather upholstered individual chairs for 20 passengers, and emergency seats for an additional 20 persons. An ice chest is provided to care for food, and drinking water is contained in large tanks carried by the bus.

Carries Movies

A special silver screen, which disappears into the ceiling, is used with a motion picture projection machine for the showing of a film which pictures the way in which axles are built and serviced. In a corner of the desk at the rear of the bus a small worm drive unit is concealed which is lifted into view by a compressed air mechanism. This is used to demonstrate how the unit can be assembled and disassembled readily.

The interior of the coach is finished in natural mahogany. Electric fans and Pullman type ventilators are



The Bus Contains a Demonstration Worm Drive Unit and a Motion Picture Projection Machine

installed in the ceiling. The exterior is blue, trimmed in cream. Shades and awnings protect the passengers from the sunlight and frosted shaded lamps provide for illumination at night.

The coach is in charge of H. C. Maddux and H. E. Larson, and has already visited Terre Haute, Ind., Decatur, Ill., Springfield, East St. Louis, Alton, St. Louis, Mo., and Kansas City.



The Modern Garage of the North Shore Line at Waukegan, Ill.

Reducing the Fire Hazard in Bus Garages

*Special committee of National Fire Protection Association
offers progress report containing detailed specifications
at annual meeting in Chicago*

SPECIFICATIONS for bus garages designed to reduce the fire hazard were presented at the annual meeting of the National Fire Protection Association in Chicago on May 9, 10, 11 and 12 by the committee on garages. The specifications were included in a progress report and no official action on them was requested this year. Members of the committee, of which H. E. Newell is chairman, include representatives of the American Electric Railway Association, the U. S. Bureau of Mines, the American Society of Heating and Ventilating Engineers, the Society of Warm Air Heating and Ventilating Engineers and the Society of Automotive Engineers.

The report covers the construction of bus garages, with limitations as to height and area and contains regulations which provide for the separation of hazards such as repairing operations, painting and heating plants, from the main garage area, and for mechanical ventilating systems wherever ample natural ventilation is not obtainable. Fire protection for storage, the use of inflammable liquids, housekeeping and various operating details are also discussed. All details of construction conform with the building code of the National Board of Fire Underwriters to which frequent reference is made in the committee's report. Following is an abstract of the report:

Heights

Bus garages shall preferably be restricted to one story in height without cellars, basements or other open spaces below the floor, but this shall not be construed as prohibiting furnace and boiler rooms below the floor and inspection or repair pits. In the case of one-story peaked roof bus garages, the height of walls above the

floor shall not exceed 25 ft. at eave lines or 30 ft. at peak of roof, except that in sprinklered garages having roof truss spans over 100 ft., a maximum height of 35 ft. at peak of roof shall be allowed, provided uncombustible draft curtains are installed extending from the roof to within 25 ft. of the floor, enclosing pocket areas of not over 5,000 sq. ft. each. Except as previously noted, the height of one-story bus garages shall be restricted to 30 ft. No story of any bus garage above the first story shall exceed 20 ft. in height for single deck and 25 ft. for double deck buses, but in all cases story height shall be sufficient to permit of at least 2 ft. clearance between the top of the highest bus and sprinkler heads.

Areas

In every bus garage the maximum area of any floor between fire walls or exterior walls, either without or with a standard equipment of automatic sprinklers, shall be as provided in the following tables, unless subdivided by non-bearing fire partitions.

Height	Frontage	Unsprinklered	Sprinklered
1-story.....1 street	8,000 sq. ft.	16,000 sq. ft.
1-story.....2 or more streets	10,000 sq. ft.	20,000 sq. ft.
2-story.....1 street	6,000 sq. ft.	12,000 sq. ft.
2-story.....2 or more streets	7,500 sq. ft.	15,000 sq. ft.

Bus garages exceeding two stories in height shall be sprinklered and preferably restricted to five stories in height. The area limitations of the following table also assume standard enclosures for all vertical openings with openings therein protected by Class B fire doors.

Frontage	3-stories	4-stories	5-stories
1 street	.....10,000 sq. ft.	8,000 sq. ft.	6,000 sq. ft.
2 or more streets	.....12,000 sq. ft.	9,600 sq. ft.	7,500 sq. ft.

Any of the foregoing area limitations may be in-

creased 50 per cent when further subdivided by fire partitions, provided that no such further subdivision exceeds 75 per cent of the maximum area prescribed by the above tables. Any two-story bus garage in which all vertical openings are enclosed in a standard manner and employing Class B fire doors at openings therein, and which has at least two street frontages, may have the prescribed areas increased $33\frac{1}{3}$ per cent when each story is provided with bus entrance direct from street.

Floors

Except as hereinafter provided, grade floors shall be of concrete or other type of approved masonry construction. Floors in upper stories may be of any type of fire-resistive construction, or may be of the mill type. An earth floor, or treated wooden blocks on a concrete base, may be used except in the repair section.

Bus garage floors of other than earth construction shall drain to an oil separator or trap discharging to drain to sewer. Where floor areas are extensive, a series of such drains shall be provided. The contents of oil separators or traps shall be collected at frequent intervals and removed from the premises.

The storage of buses above the first story shall be prohibited unless the floors of such upper stories are of fire-resistive construction with supporting columns or girders properly protected.

Roofs and Partitions

Roof coverings shall be of incombustible material or approved composition. Where roofs are supported on built-up wooden trusses, members of same shall be two-in. minimum nominal dimension.

All permanent partitions shall be built not less than four inches thick of solid or hollow brick, terra cotta, concrete, or gypsum blocks or tile; or not less than three inches thick of reinforced concrete or solid metal lath and cement plaster, or of such other incombustible materials and thickness as shall meet the requirements of the partition fire test as described in the Building Code of the National Board of Fire Underwriters. These partitions shall be protected by substantially constructed bumpers or wheel-stops so installed as to provide a minimum clear aisle space of 18 in. All exterior and division fire walls shall be parapetted.

Wall Openings and Vertical Openings

Openings in division walls or fire partitions separating bus storage sections shall be restricted to one opening not exceeding 180 sq. ft. in area for every 100 ft. or major portion thereof of such wall or partition length. Where walls are less than 100 ft. in length, one such opening shall be permitted. In addition to the above openings for buses, openings not exceeding 38 sq. ft. in area shall be permitted. All openings shall be protected on both sides of the wall with suitable automatic fire doors in the case of fire walls and on one side in the case of fire partitions.

Where exterior walls are exposed to fire hazard by reason of adjoining buildings or property, they should preferably be without openings. If openings are necessary, they shall be protected by standard fire doors or shutters or approved wire glass windows.

All floor openings such as shafts containing stairways, elevators, hoistways, chutes, ventilating ducts or similar vertical openings in bus garages of other than mill construction shall be continuously enclosed with walls or partitions.

Ramps and Doors

Where ramps are employed, they shall preferably be of a type permitting cutting off at floor levels; other-

wise they shall be continuously enclosed as required for stair and elevator shafts.

Entrance or exit doors shall be of the sliding type, double folding or jackknife type, of the vertically rolling type, or shall be swinging doors made in pairs. Swinging doors shall open outward and be so located and arranged that whether open or closed, any door of a pair will not interfere with the operation of any other door. An automatic catch shall be arranged to hold doors in the open position. Any other type of door meeting the above requirements may be approved by the authority having jurisdiction.

Lighting, Power and Heating

Lighting shall be restricted to electricity. The installation of electric wiring for light and power, and the installation of all electrical devices shall be in accordance with the provisions of the National Electrical Code for garages.

The heating of all types of garages, and adjacent buildings occupied by any department thereof, shall be done by means of either of the following methods:

(a) Steam or hot water, either direct or indirect system.

(b) Any type of warm or hot air system in which the air is not passed over a surface heated to the point of glowing or incandescence.

It is also the intent of the committee to permit unit heaters of acceptable type. A later amendment of this section will provide more detailed requirements for these and also systems of the warm and hot air types.

All boilers, furnaces, or other heat generating plants shall be installed in a fire-resistive room, having no openings in walls between this and adjacent rooms. The entrance to the boiler or furnace room shall be direct from outdoors. All air entering boilers and furnaces shall be drawn direct from outdoors.

Sufficient heat shall be supplied to permit operation of the ventilating system at all times.

Ventilation

A system of natural ventilation without mechanical means of circulating air will be permitted only where it is possible to maintain open windows at all times, and uniformly distributed in two opposite outside walls. The total area of open windows in all walls shall be at least 5 per cent of the floor area.

Where it is impracticable to operate a system of natural ventilation continuously, it will be necessary to operate a mechanical system for supplying fresh air to the room. This system may be combined with the heating installation in the form of an indirect heating system, or the two may be entirely separate installations. This system shall supply at least two cubic feet of air per minute for each square foot of floor area. This air shall be introduced uniformly into the occupied area through openings spaced not over 75 ft. apart, and not less than 6 ft. above the floor—the incoming air to be directed horizontally in all directions. Recirculation of air through the ventilating system is prohibited.

Where it is impractical to operate a system of natural ventilation, a mechanical system will be required for removing the foul air, gases, etc. This system will consist of vent openings placed not over 50 ft. apart, and within 24 in. of the floor. These openings shall be connected, either direct, or by means of incombustible ducts or flues, to one or more spark-proof exhaust fans capable of drawing through the system and delivering to the atmosphere the volume of air specified in the paragraph above. All discharge outlets shall be covered

with 20 by 30 mesh brass screens. The vent openings should be carefully located to avoid short circuiting the fresh air supply before it has been completely distributed through the room.

Repair rooms in which internal combustion motors are operated under power while stationary shall have fresh air supplied by means of a system of mechanical ventilation. Repair rooms in which internal combustion motors are operated under power while stationary shall have the exhaust gases removed. This may be accomplished by either of two methods described below:

Gravity method.—If this method is used, the motor will discharge direct to out-doors through a straight duct or pipe of incombustible material, and of suitable size, installed as an extension of the exhaust pipe or muffler; the extension in no case to exceed 15 ft.

Forced ventilation method.—By this method the exhaust gases shall be removed by means of one or more spark-proof exhaust fans, having their inlets connected to a duct system constructed of incombustible material.

Beneath each car in which a motor is operated, shall be located an air intake opening connecting into the duct system. Each intake opening shall have at least one square foot free area. A deflector hose, or flexible tube, of incombustible material shall be used to direct the exhaust gases from each motor exhaust pipe into the corresponding air intake opening to the duct system. The exhaust fans shall be capable of drawing through the above described duct system and discharging to the atmosphere, out-doors, not less than 1,000 cu. ft. of air per minute from beneath each car in which a motor is operated. All discharge outlets shall be covered with 20 by 20 mesh brass screens.

Repair rooms in which internal combustion motors are not operated under power, except when cars are in transit, shall be ventilated similarly to car storage rooms.

Fuel Burning Appliances, Pits and Trestles

Steam generators for tire vulcanizing, for oil and grease removal and for purposes other than space heating, water heaters and other fuel burning appliances such as forges shall not be installed within the bus operating section or within the carpenter or paint shop.

Elevated trestles or hoists are preferable for this service. If pits are used, they shall be continuously ventilated by a system independent of the main garage ventilating system. Such pits shall be cleaned at least daily and no accumulation of oil and grease permitted. Permanent illumination shall be provided.

Repairs

Repairs on operating floors of bus garages shall be limited to inspections and replacement of parts and repairs incident thereto, provided such repairs do not involve appliances using open flames or highly heated parts. General overhauling of the bus as a whole shall be restricted to a repair shop cut off from the operating section of the garage by a fire-restrictive partition. Lead and carbon burning, fusion gas and electric welding, blow torch work, reservoir repairs, motor testing, battery charging and all other operations involving open flames shall be restricted to the repair shop section of the garage. Paint and carpenter shops shall be cut off from the operating section or repair shop of the garage by fire-resistive partitions and openings in the fire-resistive partitions shall be protected by fire doors approved for this purpose.

If paint, varnish or lacquer spraying operations are carried on in the paint shop, the arrangement, construction, ventilation and protection of spray booths, and the

storage and handling of these finishing materials shall be in accord with the rules on this subject. In carpenter shops, the hazard of dust explosions shall be guarded against by the installation of dust-collecting systems when deemed necessary by the authority having jurisdiction.

Use and Storage of Flammable Liquids

Washing operations involving the use of volatile flammable liquids shall be carried on in a separate room or compartment cut off from the operating section of the garage by permanent partitions. Openings in these partitions shall be protected by fire doors approved for this purpose. Such rooms shall be adequately ventilated. The floor of such room or compartment shall be pitched to an oil separator or trap discharging to drain to sewer.

The storage of flammable or corrosive liquids shall be in compliance with the provisions of the regulations for the construction and installation of containers for flammable liquids. Lubricating oils, grease and waste shall be stored in a well ventilated oil room separated from the garage-operating section by permanent partitions. Openings in such partitions shall be protected by fire doors approved for this purpose.

Bus reservoirs should preferably be filled outside the garage. Inside filling operations shall be restricted to approved portable buggies and approved inside discharge systems. In all cases filling shall be by hose.

Housekeeping

Clear aisle space shall be maintained to allow ready access to fire-fighting equipment. Floors shall be kept clean and free from oil; the use of volatile flammable solvents for cleaning floors shall be prohibited.

Approved metal receptacles with self-closing covers for the storage of oily waste and rubbish shall be provided. The contents of these receptacles shall be removed daily. Waste paper and similar material shall be removed to a separate room or compartment for baling; partitions forming such room or compartment shall be constructed in compliance with the provisions above and openings therein protected by approved fire doors; or as an alternative, such material may be removed to a bin in the boiler or furnace room for baling or other disposal.

Smoking shall be prohibited except in offices or rooms provided for this purpose. Signs to this effect shall be prominently displayed.

Automatic Sprinklers and Standpipes

Every one and two story bus garage exceeding the unsprinklered area limitations and every bus garage exceeding two stories in height shall be equipped throughout with a standard system of automatic sprinklers.

In every bus garage exceeding four stories in height there shall be provided a standpipe for fire department use. In every bus garage there shall be provided for private protection inside standpipe connections supplied by pipe not less than three inches in diameter. A sufficient number of connections shall be so located that, with not more than 75 ft. of hose connected to each, any part of the building can be reached by hose. Hose shall be of approved type not less than 1½ in. in diameter with nozzle not exceeding ¾ in. Not more than 75 ft. of hose shall be kept (hung or racked) attached to each connection.

These inside standpipe connections shall have an adequate supply of water at pressures sufficient to throw streams above the highest point of the building. Supply shall be by city service or by an approved fire pump of

not less than 500 gal. capacity per minute, available for immediate use at all times, or by a tank having a capacity of not less than 20,000 gal. The tank pipe, where exposed, shall be protected from freezing.

Where there is no adequate water supply for existing standpipe systems, or where their installation is prohibited by law or ordinances, approved wheeled fire extinguishers shall be provided.

First Aid Fire Appliances

In addition to the foregoing, every bus garage shall be provided with the following first aid fire appliances: For each 2,500 sq. ft. of floor area, including decks, galleries, basements, offices and store rooms, there shall be provided one 2½ gal. approved foam type extinguisher, one approved carbon tetrachloride extinguisher of not less than 1 qt. size and one sand pail. Extinguishers and pails shall be properly distributed. At least one foam type extinguisher and one sand pail shall be provided for each oil room, and gasoline and oil filling stations. In offices and store rooms, approved soda and acid extinguishers may be substituted for those of the foam type.

Bus garages should preferably be located within the limits of a protected city or town. When not so located suitable outside protection shall be provided and a properly drilled fire brigade organized. Suitable means shall be provided for calling the municipal fire department and for notifying private fire brigades. Where a municipal fire alarm system is available a street box shall be located within 300 ft. Bus garages of large value should be provided with private protective signaling devices and preferably shall have the sprinkler system supervised.

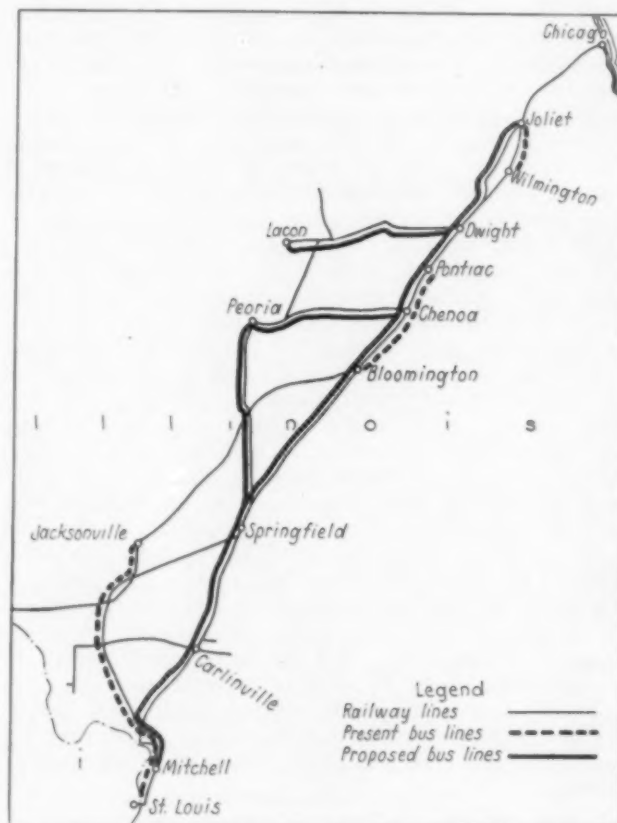
Alton Plans 500-Mile Bus System

THE Alton Transportation Company, the bus-operating subsidiary of the Chicago & Alton, is now making plans for a 500-mile system of bus lines paralleling various of its railway lines in Illinois. Applications for certificates of public convenience and necessity to permit its operation of buses on seven routes have been filed with the Illinois Commerce Commission. No date has been set by the commission for hearings on these applications, but it is expected that they will be considered in the near future.

Four of the proposed bus routes will parallel the main line of the Alton between Chicago and St. Louis. One of application is for permission to operate a bus line between Joliet and Bloomington, a distance of 90 miles; another proposes a route from Bloomington to Springfield, a distance of 60 miles; the third covers the 39-mile route between Springfield and Carlinville; and the fourth is for a bus line from Carlinville to Mitchell, a distance of approximately 50 miles.

Of the other three lines which the Alton proposes to operate, one will extend from Dwight to Lacon, a distance of 50 miles, this line paralleling the main line between Chicago and Peoria for part of its length and also the branch line to Lacon. Two routes will radiate from Peoria, one extending to Springfield, a distance of 66 miles, and the other to Chenoa, a distance of 48 miles. The total bus line mileage which will be operated under the seven certificates applied for will approximate 408. This mileage, together with the 95 mile route between Jacksonville, Ill., and St. Louis, Mo., which the Alton

has been operating for a number of months, will give it a 500 mile bus line system. In addition to the Jacksonville-St. Louis line, the Alton is now operating two bus lines parallel to its main line between Chicago and St. Louis, which were acquired by purchase from two



Railway Lines and Present and Proposed Bus Lines of the Chicago & Alton in Illinois

independent operators. These routes will be covered by the applications of the Alton now pending before the Illinois Commerce Commission.

Motor Vehicles Vital to Transportation Industry*

By Cyrus McCormick, Jr.,

Vice-President, International Harvester Company, Chicago

AT the very outset of the discussion it is necessary to face frankly the perplexing question of the proper relationship between the railways and the motor vehicle. Is this new element in transportation ruining the older? Is it merely supplying a service which the other could better perform if given the opportunity? Neither statement is true.

How many here have visited Phoenix, Ariz.? Long served by two transcontinental roads, Phoenix owes its present well-being to the vision that saw in this flat desert valley the thriving gardens that are now nourished by the water from the Roosevelt dam. Radiating fan-wise from the city is a system of concrete highways thronged with motor cars, buses, and produce-laden trucks. Water is, of course, the prime factor in the

*From an address before the World Motor Transport Congress at New York on January 10.

economic structure of that district, and yet if we visualize Phoenix bereft of any one of the forms of transportation it uses so busily, the district would immediately lose all economic value. Without the automobile those farmers could not be as efficient as they are and need to be; without the motor truck they could never carry their perishable and profitable lettuce to market; without refrigerator cars they would be marooned in the heart of a thousand miles of torrid desert.

The railways, in spite of any loss of transcontinental passenger business due to gasoline, suffer nothing because of the introduction of the motor vehicle and the hard road into Arizona, for by no stretch of the imagination could they have supplied the demand of the Maricopa County farmer. Rather, they have benefited hugely by the traffic the motor truck has helped to stimulate,—which long-haul traffic the motor truck could never in the world have handled.

Growth of Railroads

Instructive and significant as to the future of the motor truck and motor bus in our own country is the contrast between our growth of population and the growth of our railroad facilities. In round numbers we had 200,000 miles of railways in 1900 with 76,000,000 population; in 1924 the figures stood 266,000 miles of railroads, with 112,000,000 population. Roughly, then, we had one mile of railroad for every 380 population in 1900, against one mile to 444 population in 1924. Further, it appears from railroad statistics that new construction of rail lines dropped from 14,678 in the five-year period 1910-1914 inclusive, to 2119 miles in the period 1920-1924. In other words, railroad development under existing and prospective conditions of cost and returns does not and cannot keep pace with the growth of our population.

Again and again we are told by railroad executives that in order to adjust themselves to the demands of the early future the carriers must expend vast sums in betterments—in improved motive power, in trackage that will accommodate heavier traffic and in extensions of lines. Is it not clear that the motor bus and motor truck, with their flexibility and mobility have been and will be still more in the future a needed adjunct of the railroads with their severe physical and financial limitations of growth and service?

In the more developed parts of the world, as for example in the vicinity of our cities, it is probable that the railways have lost a great deal of passenger traffic and short-haul l.c.l. freight business to competing systems of motor transport. But suburban railway fares will not, we are told, yield a profit and, because of the rising cost of urban terminals, freight hardly pays. Possibly the railways object to seeing this business disappear, however unsatisfactory it may be, because long participation has made it seem the very fibre of their being. To me it seems wiser to take profit from the motor industry than to take issue with it.

Ralph Budd, president of the Great Northern, feels the same way, for he said last year, "The railways gain much more from the freight traffic the motor industry gives them than they lose from the freight and passenger business it takes away." Samuel L. Vauclain of the Baldwin Locomotive Works is even more optimistic: "In ten years the railways will hardly know what to do with the increasing business brought to them by the crossroads of motor lines now building up." Herbert Hoover, secretary of commerce of the United States, looking, as always, long ahead, sums up the matter thus: "Transportation experts are beginning to comprehend the possibilities of the motor vehicle as a co-operative instead of a competitive factor."

If the railways will recognize this, if they will come to see that the motor vehicle is a vital force that cannot be denied, if they will appreciate that it is much pleasanter and more constructive to fight for something than against it, they will understand, as it seems to be too plain for argument, that there is no real conflict between our old and new transportation agencies,—between themselves and the motor vehicle.

The proponents of the motor vehicle must, I submit, so conduct their case that they will make it easy for the railways, not to accept defeat but to accept them into constructive partnership. If, as I have been assuming, their cause is just, they must triumph in the end; but they need not expect continued public favor if they win at the cost of ruining or crippling our existing means of transportation. One cannot forget that the railways are regulated; so it is only fair to expect some form of motor vehicle regulation, particularly of interstate traffic—regulation which must in the long run work for the benefit of the public (and only for the benefit of the public) if it is to be successful.

Relief of Terminal Congestion

There is no question in the mind of the motor transport industry that the short haul, both of passengers and freight, brings little profit to the rail carrier under the best conditions and often nets him a loss. Likewise the motor truck and bus, but particularly the former, have already done much and can in the future do more to relieve the terminal congestion which is a major problem of railroad operation. The most telling consideration, however, is that the public thinks it can be better or more conveniently served by a combination of railway and motor transport than by the former alone; and what the public thinks (especially if it thinks it hard enough) is as the laws of the Medes and Persians.

Fortunately, it seems as if the railways in the United States were awakening to the trade-getting benefits of this kind of service, for two roads entering New York have made contracts with a large trucking corporation to deliver and receive freight at the corporation's five warehouses in Manhattan. The former shocking congestion at the pier terminals is divided among the five more centrally located shipping or receiving points; and if the consignee desires to pay an added fee, the shipment may be delivered directly to its ultimate destination.

Trucks Carrying Package Freight

Of even greater eventual importance with this motor truck development of terminal facilities is the growing substitution of the truck for local trains carrying package freight. At least ten railroads are shipping goods in unbroken cars to zone stations. Motor trucks are then used to carry the l.c.l. freight to intervening stations at which the heavy freight train used to stop to discharge even a single small package. When the railways go a step further and find that the same motor truck can pick up freight in the city, transport it, and actually deliver it to the village, they will be approximating the service that is now being given by independent trucking companies. I asked a merchant in our suburb why he used the truck company instead of the long-established railway. He replied, "Because it doesn't cost any more, sometimes less—and because the service is so much better and quicker. I call up the wholesaler in the morning and I have my things before night instead of next week." The motor truck is useful, and it will therefore be used.

It benefits the railways not at all to protest this sort of thing. For certain work, the motor truck is more flexible, quicker, even cheaper than the railroad and it gives better service. This service the public wants and

this service it will insist on getting. In my opinion the public does not care whether it is served by the railway or the independent motor truck operator, although, all things being equal, it would probably lean to the established business. But if the railways content themselves with protests to the Interstate Commerce Commission and try to get on without the motor truck, they will hurt no one but themselves.

B. & M. Contractor Buys Bus Chassis for Freight Service

N. F. SMITH of Lowell, Mass., one of the largest motor truck freight-hauling contractors of the Boston & Maine in the vicinity of Lowell, has purchased a Mack bus chassis with a 195-in. wheel base on which has been mounted a special truck body built by W. F. Lacey & Co., Medford, Mass. The chassis



A 180-Mile Trip with a 5-Ton Load Is Made in Ten Hours

is exactly the same as that used in bus service, having disk wheels, pneumatic tires, and a high-speed engine.

With this truck the 180-mile trip from Lawrence, Mass., to Biddeford, Me., and return, is made in 10 hours, with full loads. In the past, with a 2½ ton dual reduction trucks, this trip has required from 15 to 17 hours. Under contract with the Boston & Maine, Mr. Smith handles I.C.I. freight between Boston, Lowell, Lawrence, and points in Maine. He now has six Mack trucks of various sizes.

A Communication

Sprinklers and Fire Insurance Rates

NEW HAVEN, CONN.

TO THE EDITOR:

I have been very much interested in the two letters on page 632 of the *Railway Age* for February 26, 1927, in regard to the efficacy of sprinkler systems in bus garages. To the bus operator the real value of the sprinkler is in what it actually will do for him. Mr. Hoagland cites certain instances where fires in very large sprinkled areas have caused little damage and obviously feels that the sprinkler system under such conditions is a very material factor in reducing the hazard of the situation. To the operator who is carrying his own insurance or who is not insured at all, this fact is undoubtedly consoling. It is, however, rather interesting to see what the Committee on Garages of the National Fire Protection Association has to say on this subject, and in the regulations in which, under date of March 12, 1927, they put forward what is proper, we read under Section 2, Areas:

"In every bus garage the maximum area of any floor between fire walls or exterior walls, either without or with a standard equipment of automatic sprinklers, shall be as provided in the following tables, unless subdivided by non-bearing fire partitions as hereinafter provided, and constructed in accordance with the provisions of Section 7."

Then follows a table in which various classes of risk are given, the unsprinkled permissible area being one-half of the permissible sprinkled area, but an absolute maximum of 20,000 sq. ft. being fixed for the most favorable conditions.

It would seem that so long as the Underwriters take this stand, the attitude of the National Automatic Sprinkler Association that sprinkler systems will materially lessen the risk for very large areas is of little value to the owners of bus garages, and it would further seem that the statement of the Special Committee on Way and Structures of the American Electric Railway Association at the Cleveland convention of October 4 that "sprinkler systems will not materially lessen insurance rates for very large areas" is in error only in that it gives the impression that there is any lessening whatever of insurance rates for very large areas because of the presence of sprinklers. If Mr. Hoagland can persuade the Underwriters that the product manufactured by the members of his association will really do what he says it will, he will certainly have the warm commendation of every company considering the construction of a large garage.

CHARLES RUFUS HARTE,

Construction Engineer, The Connecticut Company.



Motor Transport News

A BILL providing for the regulation of motor buses operating in Wisconsin is expected to be enacted into law at the present session of the legislature.

THE BOSTON & MAINE TRANSPORTATION COMPANY has been authorized by the Public Service Commission of Vermont to operate over the Vermont portion of a route beginning at Brattleboro, Vt., to Northampton, Mass., via Hinsdale, East Northfield and Greenfield.

THE RUTLAND TRANSPORTATION CORPORATION, bus subsidiary of the Rutland Railroad, has been authorized by the Public Service Commission of New York to take on passengers between the Petersburg Highway and Troy Road and Beehive Crossing. Heretofore the corporation had been restricted from taking on passengers between these points.

TWO BILLS affecting buses and trucks have been enacted into law in Colorado, one of which is to become effective July 1. This bill provides for a tax of one mill per passenger mile on buses and five mills per ton mile on trucks. The second bill, which is to become effective January 1, 1928, levies a flat tax of \$5 per passenger seat on buses and \$25 per ton capacity on trucks.

THE NEW YORK, NEW HAVEN & HARTFORD, its electric line subsidiary, the New York & Stamford Railway and the County Transportation Company, a bus line subsidiary, have been granted authority by the Connecticut Public Utilities Commission to substitute bus service for trolley car service on the route between Stamford, Conn., Greenwich, Conn., and the New York State line.

THE DENVER & RIO GRANDE MOTORWAY, INC., a subsidiary of the Denver & Rio Grande Western, has been granted a certificate to operate a motor bus line between Alamosa, Colo., and Monte Vista which will enable the extension of the present line between Salida and Monte Vista to Alamosa. The order of the commission specifies that the railway must not reduce its train service and tickets must be interchangeable as between buses and trains.

E. S. AUSTIN, formerly secretary of the State Highway Commission of Missouri, will be appointed motor bus commissioner of the state by the Public Service Commission when the motor bus law passed by the last general assembly becomes effective on July 3. His duties will be to fix rates and schedules for bus lines, to prescribe the service rendered and to license buses and collect fees, subject to the approval of the commission.

THE LEGISLATURE of New Jersey has recently enacted a law providing for a tax of 1½ cents per mile on bus and trucks operated in interstate commerce on its highways. This act, which is to become effective July 1, 1927, is the first legislation to be passed under the authority of the decision of the U. S. District Court for Connecticut on January 25 stating that interstate carriers could be taxed upon a different basis from the intrastate carriers.

SUBURBAN AND INTERURBAN BUS lines operating into New York City have been given until August 1 by Police Commissioner Warren to provide themselves with New York terminals on private property. These buses, the owners of many of which have no franchises or other authority to operate in the city and which number about 500, are said materially to increase traffic congestion. The opening of the new vehicular tunnel under the Hudson, scheduled for August, is expected to add to the number of these buses.

THE SENATE of the state legislature of Missouri has passed the amended House bill providing for the regulation of motor bus lines in the state, and the measure is now in the hands of the governor awaiting his signature. Among other things, the bill provides that before the Public Service Commission shall issue a certificate of permission to operate to a bus company, it shall give reasonable consideration to the transportation serv-

ice being furnished by any railroad or other carrier and give due consideration to the likelihood of the proposed service being permanent and continuous.

THE NORTHLAND TRANSPORTATION COMPANY has been denied the right to compete with the Twin City Rapid Transit Company and its affiliated bus lines serving the Lake Minnetonka district near Minneapolis, Minn., by the Railroad and Warehouse Commission of that state. Specifically, the Northland has been prohibited from picking up Minneapolis-bound passengers at Hopkins and St. Louis Park on its eastbound long distance buses. It will, however, be allowed to pick up passengers at Excelsior, but at a rate of fare to Minneapolis 15 cents higher than the street car fare and 10 cents than the Twin City bus line fare. Permission has been granted to the Northland to extend one of its lines from Mankato to Marshall.

REDUCTIONS in round-trip passenger fares of from 10 to 45 per cent have been made by the Southern Pacific lines in Texas and Louisiana to meet bus competition. The new rates, as announced by J. F. Sullivan, assistant general passenger agent at Houston, Tex., are as follows: Between any points on the Southern Pacific lines in Texas and Louisiana, 10 per cent off on round trip tickets with a 30-day limit; 1½ fares for the round trip for week-end tickets with a Friday, Saturday or Sunday starting time and a Tuesday return limit; round trip rates of a fare and a third for departures on Saturday or Sunday and return on Monday; one way fare plus 10 per cent for a round trip on Sunday only where the one way fare is \$7 or less.

More Motor Vehicles on the South African Railways

The South African Railways motor routes may be extended considerably during the current year, according to a parliamentary speech by the Minister of Railways reported by Trade Commissioner Kilcoin at Johannesburg. The route mileage covered by the various services increased from 1,218 to 3,385 in 1926 and it is expected that this total will be doubled during the current year. A fleet of nearly 150 vehicles is now employed by the Railway Administration to cover these routes. They are principally utilized for the transportation of passengers and dairy produce such as cream, milk, butter, eggs and poultry. The railway authorities are now giving consideration to the moving of heavy farm produce by tractors and trailers and one or two experimental services of this kind will probably soon be inaugurated.

B. & M. Proposes to Substitute Trucks for Lighters in Boston

Shipping interests in Boston and other points served by the Merchants & Miners Transportation Company at a hearing in Boston last week on the proposal of the Boston & Maine to substitute motor trucks for lighterage across Boston harbor in transfer of freight between the railroad and steamship lines manifested considerable opposition to the plan. John McChord, attorney examiner for the Interstate Commerce Commission, presided.

The railroad contended that motor truck service would be more expeditious, but the opposition did not concede this. They feared congestion in the streets of Boston and at the M. & M. dock and asserted that lighters expedited the loading of vessels, since they charged from the water side while cargo from truck was loaded from the dock.

Minnesota's Highway Transport Policy

The Railroad and Warehouse Commission of Minnesota has established its policy with regard to motor truck carriers operating in competition with railways in granting a certificate to the Ward Transfer Company of Anoka, Minn., permitting its operation of a truck route in direct competition with railways. The view of the commission, as defined by Commissioner Ivan Bowen, is that the railroad carrier obligation has become primarily interstate rather than intrastate and that claims of the railroads that competition from motor trucks will do them serious

harm are not sufficient ground for preventing the development of highway transportation.

There is no denying the economy of freight transportation by motor truck, according to Mr. Bowen, who holds that the public should not be denied the lowest possible economic rates for the transportation service it requires.

An even 100 applications are now before the commission for certificates to permit motor truck operation in competition with the railways. These are expected to be acted upon within the next six weeks. At the present time the commission is insisting upon pneumatic tire equipment for motor trucks.

3,815 Miles of Bus and Truck

Lines Operated in Colorado

The 77 bus and truck lines holding certificates issued by the Public Utilities Commission of the state now operate on regular schedule over 3,815 miles of highway in Colorado, according to a tabulation by the secretary of the commission. Contract and interstate carriers are not included in this tabulation but it is estimated that the number of miles of highway covered by all the motor carriers, including them, is at least 7,500.

Of the 77 lines, 19 are bus lines, operating over 912 miles of highway; 34 are combination passenger and package freight lines, operating over 1,887 miles of highway; and 24 are freight truck lines, operating over 1,016 miles of highway.

A. A. A. Motor Bus Division

to Meet at Philadelphia in June

The first annual convention of the Motor Bus Division of the American Automobile Association will be held in Philadelphia, Pa., at the Ritz Carlton Hotel on June 15 and 16. This is a national association of motor bus owners and represents 1,500 operators owning over 12,000 buses in more than 20 states. One of the important addresses which will be made will be by A. J. Brosseau, president, Mack Trucks, Inc., and chairman, Highways committee, National Automobile Chamber of Commerce. Mr. Brosseau will speak on "The Field of the Motor Bus."

Other speakers who are on the program include H. G. Wells of the Public Utilities Commission of Massachusetts, who will speak on "Interstate Regulation of Motor Vehicles"; F. J. Scarr, consulting motor transportation engineer and formerly in charge of the Pennsylvania's auxiliary motor vehicle service, whose topic is "The Relation Between the Motor Bus and Steam Railroads"; Professor Henry R. Trumbower of the University of Wisconsin, formerly economist of the U. S. Bureau of Public Roads, who will speak on "The Economics of Highway Transportation"; and C. T. McConnell, vice-president, Ohio Motor Bus Association, whose topic is "System a Prerequisite of Successful Bus Operation."

Orders for Equipment

THE SPOKANE, PORTLAND & SEATTLE has ordered six bus chassis from the White Company, Cleveland, Ohio, upon which will be mounted bodies of its own design.

THE CHICAGO, MILWAUKEE & ST. PAUL has ordered two five-ton motor trucks with container bodies, to be used by the store department at Milwaukee, Wis., from Mack Trucks, Inc.

THE CENTRAL OF NEW JERSEY has ordered two Model L parlor car buses of 27-passenger capacity from the American Car & Foundry Motors Company for use on its Lakewood-Barnegat (New Jersey) line.

THE UNION PACIFIC has ordered three Model L, 27-passenger parlor car buses from the American Car & Foundry Motors Company for use on the Pendleton-Portland (Oregon) route by the Oregon-Washington Railroad & Navigation Company.

THE NEW ENGLAND TRANSPORTATION COMPANY has ordered five city type, 30-passenger buses from the American Car & Foundry Motors Company for use in connection with one of the electric railway subsidiaries of the New York, New Haven & Hartford Railroad.

Motor Transport Officers

E. J. Foulds, an attorney in the legal department of the Southern Pacific, with headquarters at San Francisco, Cal., has been appointed also president of the Southern Pacific



T. B. Wilson

Motor Transport Company, the bus and truck operating subsidiary of the railroad. T. B. Wilson, supervisor of transportation of the Southern Pacific, has been appointed vice-president and manager of the subsidiary, and G. L. King, assistant secretary, has been appointed also secretary of the subsidiary. Mr. Wilson entered the service of the Southern Pacific as a clerk in the passenger department, leaving the railway in 1912 to become an engineer in the United States

War Department. He returned to the Southern Pacific as a clerk in 1915 and later was promoted to traveling auditor in the accounting department. During the World War he served as a captain in the United States army, again entering the service of the Southern Pacific in the accounting department after the conclusion of his military service. In 1922, Mr. Wilson was promoted to chief clerk to the superintendent of the San Joaquin division. In February, 1924, he was promoted to supervisor of transportation, with headquarters at San Francisco, devoting a large part of his time to the study of bus and truck operation and competition. He held this position until his recent appointment as vice-president and manager of the motor transport company.

Among the Manufacturers

The C. H. Will Motors Corporation, Minneapolis, Minn., has been organized by C. H. Will and associates and has taken over the business of Wilcox Trux, Inc., with which company Mr. Will was formerly connected. The officers of the C. H. Will Motors Corporation are: President and treasurer, C. H. Will; vice-president, O. S. Caesar; secretary, J. H. Coleman.

The Kent, Ohio, plant of the American Car & Foundry Motors Company has been acquired by Frank Fageol, who has incorporated the Twin Coach Company to manufacture the "twin" motor coaches designed by him. The Twin Coach Company has been incorporated in Delaware with \$4,000,000 par value preferred stock and 400,000 shares of no par value common stock. The Kent factory was acquired by the American Car & Foundry Motors Company when it purchased the Fageol Company of Ohio.

Trade Publications

"BUYING AND SELLING BUS MILES."—The Reo Motor Car Company, Lansing, Mich., has issued a booklet entitled "Buying and Selling Bus Miles," which contains a number of reprints of editorials on bus operation which have been published in recent numbers of the Reo Bus News. Virtually all of the problems of bus operation and co-ordination are discussed.

THE STUDEBAKER CORPORATION, South Bend, Ind., has begun the publication of a Commercial Car Edition of "Studebaker Service." It is devoted entirely to descriptions of the newest and most efficient methods of insuring continuous service from Studebaker buses. In the first issue, there are discussions of how to order parts, the care of valves, bus chassis loads, the ordering of bus chassis springs, touch-up outfits for lacquer, keeping cars on the road and other similar subjects.

